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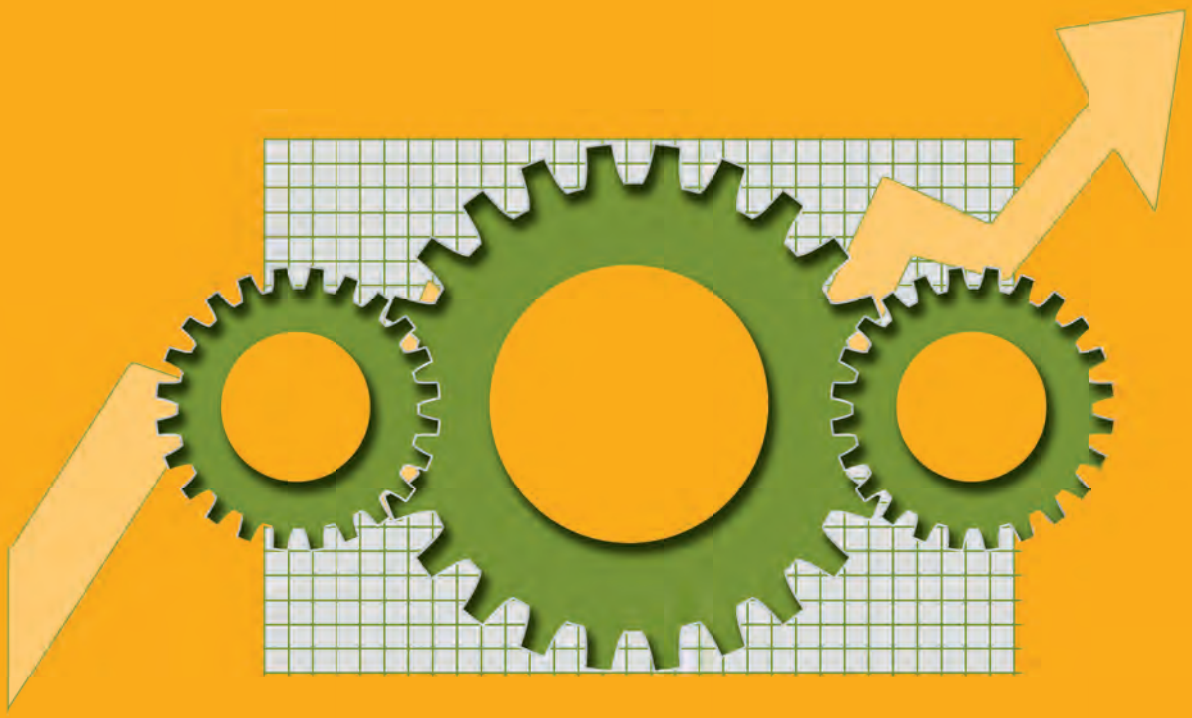

Emerging Markets and Innovation in the ICT and Pharmaceutical Sector: Role of Competition Policy

Vikas Kathuria

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Emerging Markets and Innovation in the ICT and Pharmaceutical Sector: Role of Competition Policy

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New Delhi,
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CONTENTS

CHAPTER 1

General Introduction

Whence this creation has arisen perhaps it formed itself, or perhaps it did not – the one who looks on it, in the highest heaven, only he knows or perhaps he does not know.[1]

Innovation that we generally associate with new products or process is ubiquitous in its different forms.[2] The rising standards of physical comfort, improvement in health care, ever-changing ways of communication, and on a broader level material evolution of human species are all due to innovation. At the country level, innovation is a key deriver of economic development.[3] There is little doubt about the role innovation played in buoying the US to reach the levels of economic prosperity it exhibits today.[4] For this reason, on the other side of the Atlantic as well, innovation figures prominently in the policy agenda.[5]

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1 NasadiyaSukta (hymn of creation), Rigveda (10:129); for a commentary see, Wendy Doniger O'Flaherty, The Rig Veda: An Anthology (London: Penguin, 1986) 25-26.

2 See ©OECD (2005), Oslo Manual (3rd edition) 9.

3 RM Solow, "Technical Change and the Aggregate Production Function" (1957) 39(3) Review of Economics and Statistics 312–320; GM Grossman and E Helpman, "Endogenous Innovation in the Theory of Growth" (1994) 8(1) J of Economic Perspectives 23–44; D B Audretsch, W J Baumol and A E Burke, "Competition Policy in Dynamic Markets", (2001) 19(5) International Journal of Industrial Organization 613–634.

4 Solow (n 3), Robert Solow, who is known for his path-breaking work in the growth theory that won him the Nobel Prize, showed that 90 per cent of the increase in per capita output between the years 1909 and 1949 in the US was due to the technological change which averaged 1.5 per cent per year.

5 See Innovation Union: A Europe 2020 Initiative <http:// ec. europa. eu/research/innovation-union/index_en.cfm> (accessed 9 May 2016).

Developing countries too realize the potential of innovation as a tool to lift the masses out of poverty.[6]

If innovation has such great potential to alter human life and experience, the question arises how to achieve it? Innovation is a complex phenomenon that is guided by a whole ecosystem such as R&D, absorption capability, firm culture, trade openness, access to finance, level of competition in the market, and legal framework. The R&D investment in innovation requires incentives in the form of prices that are higher than marginal cost. This means consumers pay high prices in the short run for a new product, or to support an innovative activity that would result in a new product in the future. The perennial challenge in such cases is to balance dynamic efficiency[7] gains (including innovation) that transpire in the long run, against static efficiency losses that materialize in the short run. This is the trade-off between static and dynamic efficiency. The problem is more pronounced considering dynamic efficiency is difficult to quantify.[8] Nonetheless, mature jurisdictions such as the EU and the US have increasingly started considering dynamic efficiency gains in policy-making including legal assessment. For instance, the European Commission mentions dynamic efficiency

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6 For a good perusal, see The Global Innovation Index 2015: Effective Innovation Policies for Development<https://www.globalinnovationindex.org/userfiles/file/reportpdf/gii-full-report-2015-v6.pdf> (accessed 9 May 2016).

7 The first paper of this thesis, *A Conceptual Framework to Identify Dynamic Efficiency*, explores the meaning of dynamic efficiency in detail. At this stage it can be understood that dynamic efficiency is a broad term that includes innovation.

8 IK Gotts and CS Goldman, "The Role of Efficiencies in M&A Global Antitrust in Review: Still in Flux?" in BE Hawk (ed.), International Antitrust Law & Policy: Annual Proceedings of the Fordham Corporate Law Institute (Juris Publishing Inc., Huntington 2003), 230–242.

gains in its several guidelines.[9] Dynamic efficiency gains in the US have altered the conventional antitrust analysis.[10] Several emerging markets as well mention efficiencies (including dynamic efficiency) in their competition legislation in the overall assessment of mergers.[11] But, so far dynamic efficiency has not been relied upon in the competition assessment in emerging markets.

One strand of evolutionary economics literature points out that innovation is the result of several institutions interacting with each other.[12] These institutions can be private and public firms (either large or small), universities, government agencies, government policies etc. Arguably, such institutions are missing or not fully developed in emerging economies. For example, capital markets are weak in emerging markets and cannot fund cutting edge innovation that requires massive R&D expenditures. The public funding to support innovation is also inhibited, as there are other immediate needs such as health, education, and sanitation. Notwithstanding this,

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[9] See Guidelines (EC) OJ C31/03 of 5 February 2004 on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings (Guidelines); Art 2(1)(b) of Council Regulation (EC) 139/2004 of 20 January 2004 on the Control of Concentrations between Undertakings (the ECMR) [2004] OJ L24/1.

[10] Federal Trade Commission, ―FTC Closes its Investigation of Genzyme Corporation's 2001 Acquisition of Novazyme Pharmaceuticals", Federal Trade Commission <http://www.ftc.gov/opa/2004/01/genzyme.htm> (accessed 9 May 2016).

[11] For example, Section 12A(1)(a)(i) of the South African Competition Act provides for efficiency defense in merger. Similarly Section 20(4) of the Indian Competition Act, 2002 mentions efficiency in evaluating the net effect of mergers.

[12] See Bengt-ÅkeLundvall, National Innovation Systems: Towards a Theory of Innovation and Interactive Learning (Pinter, London, 1992); Richard R. Nelson, National Innovation Systems: A Comparative Analysis (Oxford University Press, 1993).

developing countries still innovate. However, the nature of innovation in developing countries largely differs from developed countries. Most of the innovation in developing countries is small or incremental rather than path breaking or radical. That does not mean that the value of such innovation is less than the innovation that takes place in developed world. On the contrary, such innovation can be low on budget but high on social value. For example, M-PESA is a famous mobile-money system originated in Kenya that is allowing the people in developing countries to transfer cash by using their mobile phones.[13] M-PESA is an example of innovation that is leading to financial inclusion in developing world where banking has not penetrated adequately. This is grassroots or inclusive innovation based on the Information and Communication Technology (ICT). This form of innovation leads to social inclusion of people and helps overcome social challenges. There are several examples of ICT based innovation such as M-Farm[14], i Cow[15] and Mimbo Bora[16]. The Honey Bee Network in India promotes low-cost inclusive innovation by supporting innovative ideas.[17]

In addition to grassroots innovation, some more advanced form of innovation is also happening in developing countries. This form of innovation, which is basically minor and cumulative in nature, requires better skills and expertise than required for the low-cost innovation. The example of improvements made on the products of Delphi

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[13] William Jack and TavneetSuri, ―Mobile Money: The Economics of M-pesa" (2011) NBER Working Paper No. 16721.

[14] Provides price input to farmers. < https://www.mfarm.co.ke/> (accessed 9 May 2016).

[15] Assists farmers in dairy production by supplying relevant information. <http://icow.co.ke/>(accessed 9 May 2016).

[16] Assists pregnant women during pregnancy. < http://www.mimbabora.com/> (accessed 9 May 2016)

[17] The Honey Bee Network.<http://www.sristi.org/hbnew/> (accessed 9 May 2016).

Technologies in Mexico is illustrious in explaining this kind of innovation. Delphi is a multinational company with its headquarter in Troy, US. Mexican shop-floor engineers made minor changes over a period of time that cut down the product defect rates of the products of auto parts giant Delphi Technologies.[18] From simple assembly of a few components of sensors and actuators, the local engineers advanced to the level of making improvements in the equipment.[19] This is an example of incremental innovation, which in emerging markets is mostly adaptive in nature, and remains the dominant model of innovation.

The above examples show that innovation need not always be high-tech and high-value-added, which very often demands enormous amounts of R&D and skills. Innovation can also be low-cost and high on social value. There is one very interesting fact about innovation in emerging markets: most of this innovation does not take place in formal settings. To reach the advanced stages of innovation is very often a slow process. As has been observed in the case of South Korea and Taiwan, slowly the firms build up capability to take up more complex innovation.[20]

Other than low-cost and incremental innovation, there is a third kind of innovation as well in emerging markets, albeit on a small scale. This form of innovation, known as radical innovation, is an advanced level of innovation. This innovation ~~–d~~eparts from the evolutionary path of existing technologies and provides substantially greater customer

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[18] Diego Puga and Daniel Trefler, ~~–W~~ake Up and Smell the Ginseng: International Trade and the Rise of Incremental Innovation in Low-wage Countries" (2010) 91 Journal of Development Economics 64–76.

[19] Gabriela Dutrénit, ~~–T~~echnological Capability Accumulation in the ~~_~~Maquila Industry' in Mexico" (2005) *EBAPE.BR*, *3*(spe), 01-16 <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1679-39512005000500016> (accessed 9 May 2016).

[20] Global Innovation Index (n 6) page 84.

benefits than existing technologies".[21] In other words, customers get totally new benefit from the product. Examples of radical innovation can be digital photography, online banking, and smart phones. This kind of innovation is visible in the Indian pharmaceutical industry, where the indigenous firms are innovating radically new pharmaceutical products.[22]

From low-cost inclusive innovation to radical innovation, developing countries have a disparate pattern of innovation. The following table from the OECD summarizes the nature of innovation that takes place in developing countries that are at different levels of economic development.

Evidence / example	**Main agents involved**	**Type/source of innovation**	**Mechanism/objective of innovation**	**Country category**
• New plant varieties for agriculture • Efforts at developing new methods for	Universities and research institutes, leading private businesses, especially those with exposure to foreign markets and businesses	Incremental innovation based on foreign innovations and technologies	Adoption requires adaptation: Innovation needs to respond to specific "local" conditions for outcomes.	Developing/low-income countries and emerging and middle-income countries

[21] YongchuanBao, Xiaoyun Chen and Kevin Zheng Zhou, "External Learning, Market Dynamics, and Radical Innovation: Evidence from China's High-tech Firms" (2012) 65 (8) Journal of Business Research 1226-1233.

[22] Rezaie et al. identified 141 new drugs within 41 indigenous firms in China, India and Brazil. Out of these new drugs Indian firms had 90, Chinese 48 and Brazilian 27. Rahim Rezaie, Anita M McGahan, Abdallah S Daar and Peter A Singer, "Innovative drugs and vaccines in China, India and Brazil" (2012) 30(10) Nature Biotechnology 923-26.

mineral extracti on in the Chilean copper industry to satisfy local needs				
	India (nano cars; grassroots innovation) Mobile banking services	NGOs, small firms, public and private associations engaged in disseminating knowledge via networks, private, often large businesses	Incremental inno vation based on foreign technology and/or local, traditional knowl edge generated ―out of necessity". Social innovation helpin g to introduce technic al innovations in communities.	Inclusive innovation : Innovation for/by low- and middle-income household s to improve welfare and access to business opportunit ies
South Korea increased R&D in the 1990s.	Requires full developmen t of innovation systems involving diasporas as a connector.	Incremental and radical innovation capacity to compete with leading world innovators.	Build up innovation capacities that will be key for reaching the world technological frontier in many industries, esp. relevant to avoid ―middle-income traps".	Mainly middle-income countries but also some opportunit ies for developin g / low-income countries
	Innovations concerning	• Public and private univer	Major innovations and	Address environme

	soil.	sities and rese arch institutions connected to global networks. • Major private businesses operating in these sectors	scientific research conducted in glob al partner-ships but also marginal innovations to address welfare of poor people.	ntal, healt h and social challenges through g lobal innovation efforts and local efforts to address the
	Colombian and Ecuadorian flower industry Malaysia's palm oil sector	Public institutions to address co-ordination challenges, private sector initiative including foreign companies	Incremental innovations based on applying foreign innovations and technologies strategically to support industr ial development.	Build-up niche competenc ies, i.e. gr owth/ exports in sectors of comparati ve advantage.
Automoti ve industries in Malaysia and Thailand India's software industry	Involves private sectors with support from public agents, intermedi-aries, diasporas can play a central role, large firms can be important.	Incremental and radical innovation capacity to differentiate contributions	Climb the value ladder in global value chains	Mainly emerging/ middle-income countries after initial progress o n dimension s above
	Brazilian company Embraer as well as leading R&D firms from	Involves mainly the private sector in interaction with public research institutions	Innovation is identical to devel-oped countries exposed to developments in the global market.	Keep competitiv eness in frontier industries when the country is

	emerging economies	and universities, global partnerships often equally of relevance, role of large firms.		already at the frontier.

Table 1. The nature of innovation in developing countries that are at different levels of economic development. Source: © OECD (2012), ―Innovation for development: The challenges ahead", in OECD Science, Technology and Industry Outlook 2012, OECD Publishing<http://dx.doi.org/10.1787/sti_outlook-2012-7-en>

1.1. Innovation and Development in Developing Countries

There is a rich body of research that links innovation to economic growth (often measured in terms of rise in GDP).[23]The link between innovation and growth is not just limited to the developed world; there is evidence that R&D played a critical role in the growth process of Asian economies such as China, India and Korea.[24]

This thesis is an attempt to promote innovation through competition law in emerging markets, as innovation fosters development. Any such effort must, however, begin with defining development. Development is largely understood as a growth not only in Gross National Product (GNP) but also as reduction in poverty and inequality in society.[25] Another very interesting conception of development is

[23] See n (3); see also, M.Zachariadis, ―R&D, Innovation, and Technological Progress: A Testof the Schumpeterian Framework without Scale Effects,'' (2003) 36 (3) CanadianJournal of Economics 566–586.

[24] James B. Ang and Jakob B. Madsen, ―CanSecond-Generation Endogenous Growth Models Explain the Productivity Trends and Knowledge Production in the Asian Miracle Economics?" (2011) 93(4)The Review of Economics and Statistics 1360-1373.

[25] John Martinussen, Society, State& Market: A Guide To Competing Theories of Development(5th ed., London: Zed, 2005), p. 37.

given by the noble laureate, Amartya Sen. Sen views development as freedom.

"Development requires the removal of major sources of unfreedom: poverty as well as tyranny, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance or overactivity of repressive states."[26] *Interestingly, "freedoms are not only the primary ends* [constitutive] *of development, they are also among its principal means* [instrumental]*."*[27]

Sen suggests five distinct types of instrumental freedom that advance the general capability of a person: (1) political freedom (free speech and elections), (2) economic facilities (in the form of opportunities for participation in trade and production), (3) social opportunities (in the form of education and health facilities), (4) transparency guarantees (the freedom to deal with one another under guarantees of disclosure and lucidity) and (5) protective security.[28]

If freedom is the main objective and means of development, then innovation is a vehicle to emancipate and include those who have been left out of the process of growth. The ICT innovations in developing countries are a prominent vehicle to realize these freedoms.[29] M-PESA, discussed above, by ensuring economic inclusion leads to

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[26] Amartya Sen, "Development as Freedom" (Oxford University Press, 1999, first published OUP paper back in 2001) p 3.

[27] ibid, p 10.

[28] ibid

[29] For a good review of how ICT is helping in poverty alleviation, development and improving governance see World Bank, "ICT for Greater Development Impact: World Bank Group Strategy for Information and Communication Technology" (2012)<http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/WBG_ICT_Strategy-2012.pdf> (accessed 15 May 2016).

economic freedom; social media lends voice to masses, and thus ensures political freedom; mobile phones based applications are helping fight diseases such as HIV and AIDS in Africa[30], and are helping spread education[31]– this way ensuring social opportunity. The latest ICT technology assists in public safety management of crisis situations like natural disasters, health care delivery, and the distribution and use of energy.[32] These advances in technology are thus a way to realize the freedoms that Sen regards fundamental to development. Interestingly, these gains of innovation are in addition to the economic growth that is the direct result of innovation. Therefore, in addition to positively affecting growth, innovation also helps address social challenges such as poverty and health.

Innovation is an imperative for developing countries, as many a time the demand driven innovation from the Western countries does not cater to the needs specific to the developing world. For instance, not much research has been undertaken on the tropical diseases, such as dengue, malaria and tuberculosis that effect only poor people in developing countries. With an innovative capability, emerging markets can provide cure to such diseases and thereby ensure social opportunities and productivity. A

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30 Dallas Swendeman and Mary Jane Rotheram-Borus, ―Innovation in Sexually Transmitted Disease and HIV Prevention: Internet and Mobile Phone Delivery Vehicles for Global Diffusion" (2010) 23(2) Current Opinion in Psychiatry 139-144.

31 Simone Cecchini and Christopher Scott, ―Can Information and Communications Technology Applications Contribute to Poverty Reduction? Lessons from Rural India" (2003) 10 Information Technology for Development 73–84.

32 Robert J. Shapiro and Kevin A. Hassett, ―The Employment Effects of Advances in Internet and Wireless Technology: Evaluating the Transitions from 2G to 3G and from 3G to 4G" (NDN and New Policy Institute, January 2012) <http://www.sonecon.com/docs/studies/Wireless_Technology_and_Jobs-Shapiro_Hassett-January_2012.pdf> (accessed 9 May 2016).

successful example of welfare inducing local innovation can be seen in India's agriculture sector. India's Green Revolution in the 1960s encouraged innovation that in turn led to the introduction of high-yield varieties of seed resulting in increase in grain production. Thus, agricultural innovation helped India deal with food scarcity among poor.[33] Evidence also suggests that R&D-led productivity growth in agriculture leads to poverty alleviation.[34]

Further, the forces of globalization also make it mandatory for the emerging markets firms to be innovative in order to sustain competition from their Western rivals, who compete on the basis of innovative new products.

It is true that the nature of innovation changes as per the level of economic development of a country (see Table 1). Thus, the innovation policy should be country specific. At the same time, countries should endeavor to support innovation through appropriate legal framework. Recognizing the key role of innovation in economic growth, and in realizing development as freedom, the normative aim of the policymaking should be to foster innovation.

1.2 Innovation and Competition Law

In a market place, law sets the rules of behavior for the participating firms. In this way, law as a part of jurisdiction-specific policy provides a framework that may support market activities that positively affect innovation. On the other hand, if law is not appreciative of innovation, it may stifle the same. Several laws such as intellectual property, torts, taxation, and antitrust influence innovation.

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[33] ©OECD, Innovation for development: The challenges ahead, OECD Science, Technology and Industry Outlook 2012

[34] Colin Thirtle, Lin Lin and Jenifer Piesse, "The Impact of Research-Led Agricultural Productivity Growth on Poverty Reduction in Africa, Asia and Latin America" (2003) 31 (12) World Development 1959–1975.

Intuitively, IP rights– most prominently patents[35]– seem to have a direct bearing on the level of innovation, as they create legal exclusion in order to incentivize and reward innovative activity. This is a source of a firm‘s market power– an ability to raise prices above marginal cost. On the other hand, competition law is a set of rules to ensure the process of rivalry in a free market, with the eventual goal to promote ‗consumer welfare‘[36], both in the short run and the long run. In the short run an antitrust intervention may lower the prices, for example by prohibiting a merger between two rivals or by issuing compulsory license. The long run consumer welfare can be ensured through antitrust laws for example by allowing the rival firms to merge, if they can convince the antitrust body that the merger will support innovation. However, finding the optimal balance between the short run and the long run goals in competition law has been a perennial dilemma, even for the mature jurisdictions such as the EU and the US. As the legal exclusion guaranteed by IP rights is against the process of rivalry, competition law may be used for breaking the IP created market power– this is the tussle between IP and competition law. For instance, when a pharmaceutical firm refuses to share its patented Active Pharmaceutical Ingredient (API) with generic firms, or charges high prices for the same, competition law, by mandating sharing of IP right, may ensure the short run consumer welfare. To this end, the agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS) allows the Member countries to use competition law in case of ‗abuse‘ of IP rights.[37] On the other hand, an

[35] In the ever-increasing digital world, copyright is increasingly becoming important for innovation.

[36] Consumer Welfare is different from consumer interest, and is measured by the area between demand curve and competitive prices on a demand-supply curve.

[37] See Article 8(2), 31 (b) and 40 (2) of the TRIPS agreement. For an elaborate discussion see Chapter Five of this thesis.

over intrusive competition law intervention may stifle innovation by disregarding optimal incentives to innovators. This is the principal reason to decide the role that competition law can play towards fostering innovation in emerging markets.

Further, the level of competition in market determines the amount of innovation.[38] Also, activities such as joint ventures, licensing, and mergers are scrutinized by competition agencies for their possible detrimental affect on consumer welfare. In such cases, the short run losses– increase in prices due to market power– can be offset, or more than offset by gains in the long run, i.e., innovation. However, if the competition agency does not appreciate the long run gains, it may end up stifling innovation.[39] Some scholars have paid attention to the role and nature of IP rights in promoting innovation in developing countries, in light of the special economic characteristics prevailing in developing countries.[40] No such known attention has been given to the role of competition law. For these reasons, this thesis attempts to approach innovation through competition

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[38] The Industrial Organization literature, however, does not have a consensus on the optimal level of competition for innovation. See, Joseph Schumpeter, *Capitalism, Socialism and Democracy* (G. Allen &Unwin Ltd 1943); Kenneth Arrow, ‗Economic Welfare and the Allocation of Resources for Invention' in *The Rate and Direction of Inventive Activity: Economic and Social Factors* (Princeton University Press 1962); Philippe Aghion, Nick Bloom, Richard Blundell, Rachel Griffith, and Peter Howitt, ‗Competition and Innovation: an Inverted-U Relationship' (2005) 120 Quarterly Journal of Economics 701.

[39] For a detail discussion on the role of competition law in innovation see, © OECD (2006), ―Competition, Patents and Innovation", DAF/COMP (2007) 40.

[40] See for example Yongmin Chen and Thitima Puttitanun, ―Intellectual Property Rights and Innovation in Developing Countries" Journal of Development Economics 78 (2005) 474–493; Suzanne Scotchmer, ―The Political Economy of Intellectual Property Treaties" (2002) NBER Working paper 9114.

law in emerging markets, and explores the extent to which competition law can promote the long run consumer welfare by way of innovation in the ICT and pharmaceutical sectors, against the socio-economic and institutional realities in developing countries.

1.3 Competition law and Emerging Markets

As emerging markets embrace the free market economy, they require a legal framework to ensure that market power of the firms do not jeopardize consumer welfare.[41] There is, however, very little research on the nature of competition law in emerging markets. One strand of research– being mindful of the different socio-economic, and political conditions– argues a totally different ‗brand' of competition law, with different substantive features.[42] This school advocates a proactive use of competition law to promote

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[41] The concept of market power and its application in different forms is central to the competition policy. M. Motta, *Competition Policy: Theory and Practice* (Cambridge, 2009) 101.

[42] Josef Drexl, *Consumer Welfare and Consumer Harm: Adjusting Competition Law and Policies to the Needs of Developing Jurisdictions*, in Michal S. Gal et al. (eds.) The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law (Edward Elgar, 2015) 293; Eleanor Fox, *Competition, Development and Regional Integration: In Search of a Competition Law Fit for Developing Countries*, Josef Drexl et al (eds.), Competition Policy and Regional Integration in Developing Countries (Edward Elgar 2012) 273-290; William E. Kovacic, ―Institutional Foundations for Economic legal reform transition Economies: the case of competition Policy and antitrust enforcement" (2001) 77 Chicago-Kent Law Review 265; MorBakhoum, 'A Dual Language in Modern Competition Law? Efficiency Approach versus Development Approach and Implications for Developing Countries' (2011) 34 (3) World Competition 495–522; M. S. Gal and E.M. Fox, *Drafting competition law for developing jurisdictions: learning from experience*, Michal S. Gal et al (eds.), The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law (Edward Elgar 2015) 296–356.

development. On the other side of the spectrum, some commentators argue that the Western model of competition law is good for developing countries as well.[43]

The nature of competition law, like any other law, is shaped by jurisdiction-specific socio-economic, and institutional realities. The term ‗emerging markets' may invoke some common perceivable images. For instance, lack of resources, poverty, missing markets and weak institutions. Thus, *prima facie*, a different nature of competition law in emerging markets may seem appropriate. As one digs a little deeper, this general broad-brush prescription seems over simplistic. The emerging markets, even though put together in one group, consist of countries very different from each other. It is difficult to see common ground between China and countries in sub-Saharan Africa. Further, even within a country, different sectors of the economy may be at different stages of value chain, demanding different legal treatment. For instance, the pharmaceutical sector in India is showing signs of from "imitation to innovation", even as other sectors may be less developed.[44]

Competition law is a "multifaceted tool" that can be adapted to different economic circumstances in developing countries.[45]

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[43] EinerElhauge and Damien Gerardin, Global Competition Law and Economics (2nd edn., Oxford and Portland, Hart Publishing, 2011), p v; George L. Priest, *Competition Law in Developing Nations: The Absolutist View*, in D. Daniel Sokol et al. (eds.) Competition Law and Development (Stanford University Press, Stanford, California, 2013) 79-89.

[44] Joanna Chataway, Joyce Tait and David Wield, "Frameworks for Pharmaceutical Innovation in Developing Countries—The Case of Indian Pharma" (2007) 19(5) Technology Analysis & Strategic Management 697-708.

[45] Simon J. Evenett, *Competition Law and the Economic Characteristics of Developing Countries*, in Michal S. Gal et al. (eds.) The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law (Edward Elgar, 2015) page 18.

For example, large informal sector characterizes developing countries. However, this does not require a different treatment of firms in the informal sector while undertaking the competition assessment, as the conventional antitrust tools can take account of such realities. Evenett explains: "the presence in many developing countries of a large informal sector in certain markets may alter assessments of the number of substitutes available to buyers and therefore the assessment of the market power of incumbent firms."[46] However, Evenett believes that the enforcement priorities should be different in emerging markets as "spending is concentrated on a few product categories".[47]

With scant resources and little experience, the enforcement efforts should be directed at those sectors where consumers could see visible changes brought about by antitrust intervention. Evenett shows that maximum spending in the low-income countries is concentrated in food, clothing, and housing sectors. Anti-competitive practices in such sectors will have the most detrimental effects on poor. Thus, naturally, these sectors should be the enforcement priority. Moreover, high prices affect the poor consumers more than the rich consumers, as the poor consumers tend to spend a higher share of their income on basic provisions such as food staples, housing, and fuel than wealthier consumers.[48] An OECD study shows that the harm caused by monopoly power on levels of household spending on staple products like tortillas, chicken, and milk is greatest among the poorest 10% of households in Mexico.[49]

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46 ibid

47 ibid

48 © OECD, Competition Law and Policy: Drivers of Economic Growth and Development (2015) < https://www.oecd.org/development/002014381_CfD_E-book_FINAL%20VERSION%20FOR%20WEB.pdf> (accessed 9 May 2016)

49 ibid

Another question is how to employ competition law to foster development and poverty alleviation in developing countries. Does this objective require changes in competition law, such as safeguarding the local manufacturers from being acquired by international firms?[50] Or, are there less intrusive means as well? Competition law, in itself, by ensuring optimal and healthy rivalry in the marketplace increases productivity, leads to reduction in prices and development of new and better products. In turn, this leads to overall economic development, which – combined with other policies – can lead to poverty alleviation.[51] A healthy process of competition ensures that only efficient firms stay in the market (productive efficiency); rivalry among competitors also reduces prices of commodities, and thereby leads to more economic inclusion (allocative efficiency); finally, in order to compete with rivals, firms innovate (dynamic efficiency).[52] These factors, in turn, translate into growth at a macroeconomic level.

The newly liberalized emerging economies may have dominant previously state-owned firms. Thus, competition is a good tool to ensure optimal markets by facilitating entry of smaller firms in the market place by guarding them against the unfair use of the market power of

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[50] For example Drexl is of the opinion that ―protection of the local competitors against incoming international players should not be excluded from the ambit of domestic competition law (of developing countries)", see Drexl (n 38) p 293.

[51] See Simon J. Evenett, *What is the Relationship between Competition Law and Policy and Economic Development?*, in Douglas H. Brooks and Simon J. Evenett, Competition Policy and Development in Asia (Palgrave Macmillan, London, 2005) 1-26; Stefan Voigt , ―The Effects of Competition Policy on Development – Cross-Country Evidence Using Four New Indicators" 45 (8) (2009) Journal of Development Studies 1225-1248; see also © OECD (n 48)

[52] OECD (n 48)

dominant undertakings. Therefore, pure competition in itself is a way to ensure development, as has been observed in the following text.

"Competitive markets are the best way yet found for efficiently organising the production and distribution of goods and services. Domestic and external competition provides the incentives that unleash entrepreneurship and technological progress."[53]

This is not to say that developing countries are not different. The difference can be economic, social, political, and institutional. So far as the economic differences are concerned, this thesis argues that the special characteristics of emerging markets do not warrant different substantive rules, as the existing tools of mainstream competition law are flexible enough to be employed in the special economic settings of emerging markets.

As regard the social characteristics of developing countries are concerned, some emerging jurisdictions, most prominently South Africa, try to achieve social causes such as empowerment of historically disadvantaged groups through competition law. Such ingenious and well-intentioned additions in competition legislation may rather lead to practical problems with regard to enforcement. For example, an acquisition that changes the ownership of a firm from disadvantaged sections to non-disadvantaged section may run foul of specific provisions of the South African competition legislation.[54] At the same time,

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[53] World Bank, World Development Report, 1991, p.1

[54] For similar cases see ©OECD, Competition Law and Policy in South Africa, An OECD Peer Review (2003)<http://www.oecd.org/daf/competition/prosecutionandlawenforcement/2958714.pdf> (accessed 6 April 2016); see also, VaniChetty, "The Place of Public Interest in South Africa's Competition Legislation: Some Implications for International Antitrust Convergence" (2005) ABA Section of Antitrust Law <http://apps.americanbar.org/antitrust/at-committees/at-ic/pdf/spring/05/aba-paper.pdf>(accessed 6 April 2016)

however, this acquisition may have positive effects on the overall consumer welfare. In such scenario, it is difficult for an antitrust regulator to balance, at least economically, competing goals. Further, a balancing exercise in such cases makes the competition law enforcement vulnerable to subjective considerations. Any inclusion of public interest goals makes the competition law enforcement politically sensitive too. It is difficult to imagine how economic reasoning, howsoever convincing, would take preponderance over public interest goals. This should be seen against the institutional backdrop in emerging markets, where newly established competition regulators may not be politically independent. Furthermore, antitrust guidelines that provide an objective legal framework for antitrust assessment may be missing, as the antitrust jurisprudence is scant. Some scholars also support taking into consideration the protection of local manufacturers against international players through competition law.[55] Any such attempt, however, will reduce competition law to merely an industrial policy tool. A more optimal solution would be sector-specific Foreign Direct Investment (FDI) policy. If such acquisitions are considered detrimental for local businesses, the government can cap the maximum limit of FDI in a particular sector. Therefore, the more optimal solution is to achieve public interest through other legislations and policies, provided they are within the WTO framework.

The spread of market may have overall positive effects on the well-being of people. However, free market economy does not come without evils. Policy makers have to grapple with concomitant problems such as rising pollution, increasing unemployment, and economic downturns. On a different level, rising individualism and stress are also attributed to the ever-growing pressure to

[55] Drexl (n 42)

perform well in highly competitive working environment. But, as we know, each statute is aimed at addressing some specific mischief. To this end, competition law is aimed at checking the misuse of market power of players in a free market, with the end aim to ensure consumer welfare both in the short run and the long run.[56] Consequently, any such objective that cannot be accommodated within the economic meaning of the short run or the long run consumer welfare falls outside the scope of competition law. There are other tools for these objectives such as consumer protection laws, Small and Medium-Sized Enterprise (SME) policy, and social welfare policy.

Antitrust cases involve heavy economic analysis, and market assessment requires professional skills and experience. Arguably, the know-how and required skills are not readily available to the antitrust regulators in emerging economies. In view of the complexities involved in taking Economics-Based Model (EBM) of competition law as prevalent in the EU and the US, one commentator has argued for adapting the role of economics in the context of emerging markets.[57] Gerber, in view of resource limitations, lack of training and expertise, limited experience, and learning and application obstacles suggests a ‗descriptive' role of economics for developing countries. As per this approach, the resort to economic analysis should be made only in limited cases.[58] However, this

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[56] Of course, the short run and the long run consumer welfare present a policy choice.

[57] David J. Gerber, ―Competition Law and the Economic Characteristics of Developing Countries" Michal S. Gal et al. (eds.) The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law (Edward Elgar, 2015) 248.

[58] ibid, ―Economics can, for example, play a descriptive role. In this function, economics is used to interpret data. It answers questions such as ‗What actually happened?', ‗What are the likely consequences of a particular agreement such as, for example, a merger agreement?'."

approach does not offer a practical framework for competition analysis. Almost all competition law cases require thorough economic analysis. Consequently, any reduced or narrow application of economics in competition cases would entail either over enforcement (Type 1 error) or under enforcement (Type 2 errors)– both are bad for consumers and firms.

As seen above, the jury is still out on the true role and nature of competition law in emerging markets. There are wide-ranging differences among scholars. At the same time, competition regimes in these countries are increasingly dealing with complex cases, especially in the high-technology sector where innovation is often the key to compete successfully. High-technology firms such as Google and Facebook are present everywhere, and their practices result in similar legal consequences in emerging markets as well. Thus, it seems appropriate to equip the competition agencies in these countries with adequate tools and training, rather than changing the standards of analysis.

The legal and economics literature, in general, uses several terms to denote developing countries. There is no standard definition of a ‗developing country' or ‗emerging market'. Different institutions have different criteria to classify a country as developing.[59] There is, however, a consensus on the following features of developing countries: presence of high transaction costs, which often include corruption; weak institutions; markets are often incomplete, weak or non-existent; often research organizations and multinational companies operating at the technology frontier coexist with

[59] See, Peter Marber, ‗Redefining EM: Country clusters offer new matrix', Financial Times (August 5, 2015); see also Robert E. Hoskisson, Lorraine Eden, Chung Ming Lau and Mike Wright, ―Strategy in Emerging Economies" (Jun., 2000) 43(3) The Academy of Management Journal 249-267.

micro-enterprises having little technological capacities; several LDCs have low innovative capabilities and are dependent on industrialized countries for the provision of new technology and knowledge; domestic demand is usually small; and agriculture is a critical sector in economy.[60] For the purpose of competition law following are the common features of developing countries: lack of competition culture; concentration of economic and political power, which facilitates the capture of public entities; scarcity of financial and human resources; abundance of small and medium-sized firms, and lack of capacity in the judicial system.[61] This thesis uses the terms emerging markets, developing countries, and transition economies interchangeably.

1.4 The Gap in Scholarship

As innovation is increasingly becoming important in developing countries, it is crucial to provide supporting institutions. In this regard, the role played by law in providing a more enabling environment is crucial. However, as scholars are mostly debating the nature of competition law in emerging markets, little research has been undertaken on the role of dynamic efficiency, and how the same can be promoted through competition law in developing countries.[62]

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[60] Andréanne Léger, "The Role(s) of Intellectual Property Rights for Innovation: A Review of the Empirical Evidence and Implications for Developing Countries" (2007) DIW Berlin, Discussion paper 707 <https://www.diw.de/documents/publikationen/73/61916/dp707.pdf> (accessed 6 April 2016)

[61] See, Competition Policies in Emerging Economies: Lessons and Challenges from Central America and Mexico (Claudia Schatan and Eugenio Rivera eds., Springer 2008)16.

[62] A prominent study is A Singh, "Competition and Competition Policy in Emerging Markets: International and Developmental Dimensions" (G-24 Discussion Paper Series, No 18, September 2002) <http://unctad.org/en/docs/gdsmdpbg2418_en.pdf> (accessed 6 April 2016). Singh suggests that even developing countries can pursue dynamic efficiency.

Evidently, the task to balance the short run losses against the long run gains is more difficult in emerging markets against the backdrop of poverty, socio-economic inequalities, technological differences, and institutional capacity. This, however, warrants a more active interest of scholars in this conundrum. The problem is not just an academic one. The competition agencies in emerging markets are dealing with or bracing themselves to deal with extremely complex cases in high-technology sectors where innovation occupies the center stage. For example, standardization processes and their interface with competition law are extremely technical issues. Not only do such issues demand a shift from conventional static efficiency based approach to considering dynamic efficiency issues, they also demand the competition agencies in developing countries to appreciate the progression and evolution of technology. China and India are already grappling with the legal issues involved in the standardization processes.[63] The other developing countries also realize the importance of their participation in the standardization processes.[64] For example, Africa and Arabic regions have their own intergovernmental standards body, the African Organisation for Standardisation (ARSO) and the Arabic Industrial Development and Mining Organization (AIDMO) respectively.

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[63] See, the DIPP paper in India, "Discussion Paper on Standard Essential Patents and their Availability on FRAND terms" <http://www.ipindia.nic.in/Whats_New/standardEssentialPaper_01March2016.pdf> (accessed 6 April 2016); For an overview of the position in China see D. Daniel Sokol and WentongZheng, "FRAND in China", 22 Texas Intellectual Property Law Journal. 71 2013-2014.

[64] For an account of standardization capabilities in developing countries see the ITU report, ICT Standardization Capabilities of Developing Countries: Bridging the Standardization Gap<https://www.itu.int/dms_pub/itu-t/oth/0B/1F/T0B1F0000013301PDFE.pdf>(accessed 6 April 2016)

Even though developing countries are yet not actively participating in international technology standard setting, this process does affect them inasmuch as the firms in developing countries are the users of international standards. In fact, the World Telecommunication Standardization Assembly (WTSA)-12 resolution 44 recognizes the "standardization gap" between developed and developing countries and advocates for bridging the same.[65]

Increasing international trade has also exposed the developing countries to complex legal issues that merit the same gravity and consideration as they merit elsewhere in the developed world. For instance, determination of complex legal issues including dumping, countervailing duties, and de-minims limits requires the application of economics. Therefore, any such proposal that competition law enforcement in emerging markets should not follow or follow a limited economics-based approach is far-fetched from reality.

The Global Financial Crisis (GFC) of 2007, whose effects still linger, further showed that financial markets in emerging markets are not insulated from the global shocks.[66] Financial markets are complex, and equally complex are the financial products. It requires a great deal of legal and economic understanding to fully comprehend financial products such as Collateralized Debt Obligations (CDOs), derivatives, and repos for the purpose of regulation. To assume that developing countries lack know-how and resources; and, therefore, recommend a sub-optimal legal framework is to let developing countries

[65] Resolution 44 - Bridging the standardization gap between developing and developed countries <http://www.itu.int/pub/T-RES-T.44-2012>(accessed 6 April 2016)

[66] Bruno Gurtner, "The Financial and Economic Crisis and Developing Countries", International Development Policy p 189-213<https://poldev.revues.org/144> (accessed 6 April 2016).

languish in mediocrity. Instead the focus should be on capacity building through increased cooperation. In this regard, the International Competition Network (ICN), UNCTAD, the European Commission, and the US Department of Justice (DOJ) have taken some steps.

The foreseeable new era of technology, characterized by ‗Internet of Things' (IoT) and ‗Big data' is ushering in a new era. IOT comprises of connected machines (Machine-to-Machine, M2M) and connected environment (Machine-to-Person, M2P). The International Telecom Union (ITU) predicts 25 Billion Networked Devices by 2020. Developing countries too have already started resorting to ‗IoT' and ‗Big Data' analysis to solve critical issues in the third world such as sanitation, healthcare and agriculture.[67] The following illustration from the ITU highlights the role played by the new technology in developing countries.

[S]ensors in agricultural fields are monitoring soil conditions and moisture levels. RFID tags are helping farmers provide more personalized care for their livestock. Connected thermometers are monitoring vaccine delivery and storage in real-time. Cameras and sensors in smartphones and tablets are allowing healthcare workers to provide remote diagnosis of disease. And off-grid solar systems, monitored via SMS, are bringing affordable electricity to lower income families.[68]

The ‗IoT' and ‗Big Data' present emerging markets with not only new opportunities, but also with new challenges. The IoT has regulatory implications across the areas of licensing, spectrum management, standards, competition, security, and privacy.[69] Further, the new ICT

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[67] The ITU report, Harnessing the Internet of Things for Global Development <https://www.itu.int/en/action/broadband/Documents/Harnessing-IoT-Global-Development.pdf>(accessed 6 April 2016)

[68] ibid

[69] ibid

technology is facilitating a different kind of innovation where users contribute in the innovation process- this form of innovation is knows as ‗open innovation' or ‗user innovation'.[70] This new form of innovation as well presents challenges for conventional competition law and intellectual property paradigms.

Consequently, as the world enters a new era of technology, the legal and regulatory framework should be well prepared to deal with the new challenges. In this vein, the research in this thesis takes a forward-looking approach in terms of identifying the importance of innovation in the development process, and attempts to make adequate space for it in the competition law enforcement in emerging markets.

While discussing the nature of competition law in emerging markets, and exploring the possible ways to incorporate dynamic efficiency concerns, it is crucial to look at the patent-antitrust interface. After all, the legal monopoly by virtue of patents may lead to higher prices– this may be the motivation for emerging markets to employ competition law to break such monopoly. One view is that patent and antitrust have the same objective–innovation. The following observation of R. Hewitt Pate manifests this view.[71]

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[70] Henry W. Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology (Harvard Business School Press, 2003); Eric Von Hippel, Democratizing Innovation (MIT Press, Cambridge, 2006)<http://web.mit.edu/evhippel/www/books/DI/DemocInn.pdf> (accessed 6 April 2016); Geertrui Van Overwalle, ―Inventing Inclusive Patents: From Old to New Open Innovation" (December 26, 2014). Kritika: Essays on Intellectual Property, vol. 1, P. Drahos, G. Ghidini and H. Ullrich (eds.), Edward Elgar, 2015, 206-277<http://ssrn.com/abstract=2705109> (accessed 6 April 2016)

[71] R. Hewitt Pate, ―Antitrust and Intellectual Property" <https:// www.justice.gov/atr/speech/antitrust-and-intellectual-property> (accessed 6 April 2016).

A few decades ago, it might have been accurate to say that antitrust and IP were in conflict. In fact, for many years my own agency had a "Professions and Intellectual Property" section that was active in opposing the exercise of IP rights. In that era, our view was that intellectual property rights regimes created monopolies to spur innovation, while the antitrust laws sought to eliminate monopolies. The modern view, in contrast, is that intellectual property and antitrust laws both seek to promote innovation and consumer welfare.

This view, however, suits developed economies that are at the forefront of technological frontier. The policy choice is, therefore, in favor of strong patent rights.[72] At the same time, loose patent rights might adversely affect the local innovators in developing countries– or, at least, in those sectors that have started showing the signs of innovation. Therefore, ideally, the balance between patents and antitrust in developing countries depends on the technological capability to innovate in a specific sector.[73] This thesis (the fifth chapter) looks into this interface from a Systems of Innovation approach.

1.5 Research Areas and Questions

The thesis comprises four papers. Each paper has different set of research questions. Also, the research methodology adopted varies. The broader research question, however, that sets the research path is: to what extent competition law can foster innovation in the ICT and pharmaceutical

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[72] For example see Case T-201/04, *Microsoft Corp. v. Commission*, 2007 E.C.R. II-3601 (Ct. First Instance) in EU, and *Verizon Communications, Inc v Law Offices of Curtis V Trinko*, LLP 540 US 398 (2004) in the US.

[73] Thomas K. Cheng, "The Patent - Antitrust Interface in Developing Countries", in Daniel D. Sokol, Thomas K. Cheng, and Ioannis Lianos (eds.) *Competition Law and Development* (Oxford University Press, 2013) 212-227.

sectors in emerging markets? This question is asked in the context of the short run imperative of ensuring easy access, as the majority of the population is less well off, institutions are underdeveloped, and the general economy is backward.

The sectors of inquiry are the Information and Communication Technology (ICT) and pharmaceutical sectors. Both these sectors are high-technology areas, where innovation is a key aspect of competition.

The ICT sector is a platform sector that supports other industries in manufacturing and services.[74] In developing countries, access to ICT is showing positive effects on healthcare, governance, education, poverty alleviation, and even in reducing corruption. ICT can also play the key role in facilitating modern urbanization in developing countries by supporting ‗smart cities'.[75] Thus, it is an imperative that the masses can get cheap access to the ICT technology. At the same time, ICT happens to be a dynamic sector where the technology gets obsolete quickly. The latest ICT technology such as optical fiber, 4G and 5G technologies increase spectral efficiency and thus support better communication, and facilitate innovative services. Therefore, the policy dilemma in this sector is between incentivizing new technology and facilitating cheap access.

Innovation in the pharmaceutical industry is in decline.[76] As the innovation declines, the firms in the pharmaceutical

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[74] Johannes M. Bauer and Woohyun Shim, ―Effects of Regulation on Innovation in the Information and Communications Sector" (2012) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2028523> (accessed 6 April 2016).

[75] Jung Hoon Lee, Marguerite Gong Hancock and Mei-Chih Hu, ―Towards an effective framework for building smart cities: Lessons from Seoul and San Francisco", Technological Forecasting & Social Change 89 (2014) 80-99.

[76] David F Horrobin, ―Innovation in the Pharmaceutical Industry" (2000) 93 Journal of the Royal Society of Medicine 341-345.

sector are choosing to merge in order to be profitable.[77] The development of new drugs requires legal and regulatory framework to ensure adequate incentives. This is possible only when firms charge prices above marginal cost. The legal monopoly by way of patents allows firms to charge such prices. In developing countries, where the consumers are poor, high prices may prevent them from accessing the life-saving medicines. In turn, poor health has adverse effect on country's productivity, growth, and ultimately on economic development.[78] Naturally, affordable price is the most crucial factor that enables access to medicines.[79] In this regard, the role played by generics in increasing price competition, and thereby reducing prices is crucial. Therefore, it was pertinent to look at the role that competition law can play in opening up access for generics.

The thesis also explores the balance between IP and Competition law. Theoretically, there are two choices for developing countries. First is to allow the local firms to imitate. Second, to promote innovation by ensuring adequate incentives for innovative firms. So far as the latter choice is concerned, domestic innovators may also, at least theoretically, benefit from strong IP rights. The latter option has prompted some to advocate strong IP rights in emerging markets for the sake of supporting domestic innovation.[80]

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77 ibid

78 Matthew A. Cole and Eric Neumayer, ―The impact of poor health on factor productivity: an empirical investigation" (2006) 42 (6) Journal of Development Studies 918-938 <http:// eprints. lse. ac. uk/ 19780/1/ The % 20 impact% 20of% 20poor% 20health% 20on%20 factor % 20 productivity (lseror). pdf> (accessed 6 April 2016).

79 The WHO recognizes this. See, Access to Medicines<http: // www. who.int/trade/glossary/story002/en/>(accessed 6 April 2016)

80 Chen and Puttitanun (n 40)

Chen and Puttitanun explain that the optimal IP regime follows the development trajectory in a specific jurisdiction.[81]

"Starting from low levels of economic development, an initial increase in a country's technological ability has a greater impact on the efficiency of imitating northern technologies than on the efficiency of domestic innovations, which makes it desirable for the country to lower IPRs. Once the country's technological ability is above a certain threshold, the imitation effect is dominated by the innovation effect, and the optimal protection of IPRs increases with the levels of development."

This finding is extremely relevant for the purpose of striking the right balance between competition law and IP. Evidently, when a country has no or little innovative capability, a strong IP regime would be counterproductive. However, there is one additional element that must factor in policy-making– within a country, different sectors of the economy may be at different stages of value chain. Thus, the balance between competition law and IP should vary from sector to sector. This theme has been developed in paper three and four of the thesis. Especially, the fourth paper approaches this concept through the framework of Systems of Innovation and investigates the innovative capability of the Indian and Brazilian pharmaceutical sector to draw a prescription for compulsory licenses.

1.6 Preview

The main contribution of this thesis is to analyze the extent to which innovation can be pursued through competition law and policy in developing countries. As discussed above, there is a dearth of competition law scholarship that looks into the trade-off between static and dynamic efficiency within the context of emerging markets. The

[81] ibid

starting point of the research is the benefits that result from innovation.

Even before the sector enquiry could be taken up, it was pertinent to have an understanding and definition of dynamic efficiency. A preliminary research revealed that there was a general disagreement on the definition of dynamic efficiency. Economists, in general, even while determining efficiency as the goal of competition law, do not define it categorically. A proper recognition of dynamic efficiency in competition assessment, however, is not possible unless lawyers understand the ambit of the same. The first paper, *A Conceptual Framework to Identify Dynamic Efficiency*, published in the European Competition Journal[82], is devoted to this issue. This paper after analyzing the main definitions of dynamic efficiency develops a conceptual framework to identify the same.

The second paper of the thesis, *Access and Investment in the ICT Sector for Developing Countries*, published in the Law and Development Review[83], looks at the trade-off between static and dynamic efficiency in the ICT sector. The ICT sector is quite peculiar in that it has positive effects on the key aspects of development such as education, health and governance. Thus, ensuring access to telecom services is crucial in developing countries. On the other hand, the ICT sector is characterized by rapid technological changes. The new generations of ICT are not only faster and more efficient, but more expensive as well. Interestingly, the new ICT technology has better potential to develop new businesses, facilitate healthcare and support economy. The paper recognizes this trade-off, and by discussing two specific policies, Local Loop

[82] A Conceptual Framework to Identify Dynamic Efficiency (2015) 11(2-3) European Competition Journal 319-339.

[83] Access and Investment in the ICT Sector for Developing Countries (2015) 9(1) Law and Development Review 1-27.

Unbundling (LLU) and Universal Service Obligation (USO), suggests measures to facilitate investment and innovation in the new technology without jeopardizing access. This approach, while recognizing that due incentives for the innovative firms is crucial, especially when return on investment is uncertain, gives due weightage to the need of local population to access the ICT services. This pragmatic approach is important in the wake of other perplexing issues in the ICT sector such as Network Neutrality– the policy choice for which cannot always be binary. The research in this paper is helpful to this end, as it advocates a legal framework that facilitates the adoption and diffusion of latest ICT technology by promising incentives to the private sector, while ensuring affordable access at the same time. This new technology, in turn, fosters more innovation and inclusion, and development on the local level.

The third paper in the thesis, *Pharmaceutical Mergers and their Effect on Access and Efficiency: A Case of Emerging Markets*, published in the World Competition Law and Economics Review[84], shifts the focus of enquiry from the ICT sector to the pharmaceutical sector. A choice between the short run and the long run efficiency becomes more difficult in the pharmaceutical sector, as access to healthcare is one of the basic human needs. Since the bigger part of the population in developing countries still languishes in poverty, ensuring cheap access often requires government intervention including price regulation. Against this backdrop, the third paper looks at the effect of pharmaceutical mergers on access and efficiency in developing countries.

[84] Pharmaceutical Mergers and their Effect on Access and Efficiency: A Case of Emerging Markets (2016) 39 (3)World Competition Law and Economics Review451-478.

The acquisition of generic pharmaceutical firms by foreign branded pharmaceutical firms may cause concerns, as the firms in developing countries may stop producing cheaper alternatives to branded medicine post acquisition. This fear can result in using competition law as an effective industrial policy tool to insulate the local generic pharmaceutical firms from being acquired by the multinational firms. Further, pharmaceutical mergers may be motivated by the desire to achieve efficiency, including innovation. These two issues have been analyzed in this paper. Furthermore, this paper also discusses the nature of competition law in emerging markets. As opposed to suggesting that substantive competition law rules should be changed in the special socio-economic setting of developing countries, the framework developed in this paper argues that application of competition law is sector-specific, and is guided by socio-economic realities of a particular sector and institutional realities of the jurisdiction.

The final paper of the thesis, *Competition Law and Compulsory Licenses in Emerging Markets: A Systems of Innovation Approach*, under review for publication, deals with one of the most controversial issues in competition law– compulsory licenses. The primary criticism of compulsory licenses is that they disincentivize innovation. However, compulsory license is a potent policy tool to ensure access by reducing prices. In order to best analyze the trade-off between the short run and the long run, and make an optimal choice between the two, the paper relies on the concept of Systems of Innovation. One of the primary themes in this thesis– competition law application is sector specific– finds a proper substantiation in this paper. After investigating the innovative capability of the Brazilian and the Indian pharmaceutical sector, the paper makes a prescription for issuing compulsory licenses. The principle that emerges from this research is:

when a sector does not exhibit any innovative capability, the policy choice should be in favor of maximizing the short-run welfare, as the short run gains are higher than the long run losses.

The common theme running through the mentioned papers is whether, and to what extent, dynamic efficiency concerns can and should be pursued through competition law and policy within the specific socio-economic and institutional context in emerging markets in the ICT and pharmaceutical sectors. The link begins with the first paper by establishing a theoretical framework to understand dynamic efficiency and differentiate it from static efficiency. This way the first paper serves as the prelude to the other chapters. Thereafter, the extent and viability of innovation and diffusion of the latest technology is traced in the ICT sector within the context of developing countries. The link further stretches to the last two papers that look at the trade-off between the short run losses and the long run gains in the pharmaceutical sector.

1.7 Methodology

The investigation undertaken in the thesis predominantly takes a law and economics approach. The endeavor in this research is to recognize innovation in competition assessment, as innovation is a more efficient choice over the short run goal of ensuring cheap prices. However, the concept of efficiency is debatable. A choice that maximizes the aggregate welfare may be efficient in the utilitarian sense of the word, but it will not be fair or just when social realities are obfuscated.[85] This should be seen

[85] Stephen E. Margolis, "Two Definitions of Efficiency in Law and Economics" (1987) 16 (2) The Journal of Legal Studies 471-82. Margolis observes: "A faulty definition of efficiency will lead to a faulty analysis, which could exclude key features of the social situation that must be accounted for in any assessment of the legal setting."

against the broad notion of development, which goes beyond GNP growth, this thesis relies on.

In this regard, the next question is to what extent can fairness or equity be accommodated in the antitrust analysis? The tools of competition law are specific– they are aimed at achieving a particular goal, i.e., consumer welfare.[86] The choice of consumer welfare over producer welfare itself is a safeguard against the aggregate wealth maximization that competition law can ensure. The investigation in this thesis is mindful of social realities in emerging markets. For example, chapter four, while discussing cross-market efficiencies, argues that in light of different buying power of two different groups of consumers, cross-market efficiencies should not be taken into account while assessing efficiency claims in mergers.

The methodology avoids a utilitarian approach that treats one person‘s pleasure as much as another‘s, regardless of the real distinction between two.[87] When the capital markets are weak, consumers are poor, and share holding is not widely dispersed, reliance on aggregate data is misplaced– this is the limited extent of redistribution that antitrust can offer. For this reason, the fourth chapter advocates consumer welfare standard over total welfare standard. Even while advocating the long run consumer welfare through innovation, which requires the short run losses, the thesis takes a skeptical view and places a burden on the claimant to prove the likelihood of innovation to offset the short run losses. This delicate balance between

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[86] The area between competitive prices and demand curve is considered as consumer welfare, and is typically measured by consumer surplus.

[87] Robert D. Cooter, *The Confluence of Justice and Efficiency in the Economic Analysis of Law*, in The Origins of Law and Economics: Essays by the Founding Fathers (2003) <http://works.bepress.com/robert_cooter/106/> (accessed 9 May 2016).

efficiency and justice has influenced the overall research in this investigation.

The papers in the thesis do not follow the same methodology. The overarching research topic, *Emerging Markets and Innovation in the ICT and Pharmaceutical Sector: Role of Competition Policy*, is divided into several research questions and hypothesis in the four papers. The first paper is theoretical in nature. This paper analyzes various different definitions of dynamic efficiency given by economists and policy institutions. These definitions are then categorized into four approaches based upon the view they take of dynamic efficiency. After identifying the limitations of every approach, a holistic definition is proposed.

The second paper recognizes the importance of investment in the ICT innovation and its diffusion in emerging markets, as a tool to foster development. The research, however, approaches economic development from the law and development literature. Thus, economic development also encompasses poverty alleviation and inequality reduction. Thereafter, two specific policies– Local Loop Unbundling (LLU) and Universal Service Obligation (USO)– have been analyzed, as they present a trade-off between ensuring cheap access and incentivizing innovation and diffusion of the latest technology. The analysis looks at the changing treatment of LLU and USO in mature jurisdictions, and then analyzes the viability of these policies in the socio-economic settings of developing countries. This paper also takes note of the changes in the ICT technology.

The third paper takes a law and economics approach to define the nature of competition law in emerging markets. In addition, it also borrows from the public choice literature in order to assess the regulatory environment, and makes prescriptions with respect to enforcement. The

fourth paper draws from the Systems of Innovation approach that has its genesis in evolutionary economics. It also compares the pharmaceutical sector in two jurisdictions, India and Brazil, so far as their innovative capability is concerned. Brazil and India were chosen for comparison as they have accumulated technological capabilities that facilitate the transition from production to innovation. This paper uses quantitative approach to gauge innovative capability of the Brazilian and Indian pharmaceutical sector. Thereafter, it uses the finding to prescribe suggestion for issuing compulsory licenses under competition law in these two countries.

1.8 Significance of the project

The project is an attempt to recognize the role of innovation in fostering development in emerging markets, and prepare a supportive competition law and policy framework for the same. As discussed above, innovation in developing countries leads not only to economic prosperity but also to social inclusion. The thesis, therefore, sees innovation as a vehicle to achieve not only economic development, but also as a means towards various freedoms. It is true that a policy choice favoring the long run efficiency in emerging markets is difficult, as the majority of the population is less well off. Intuitively, the infrastructure and institutions that support innovation are under-developed in emerging economies. Consequently, innovation does not figure in policy discussions very often. Policy making, however, is not a realm of intuitions and fancies. This thesis, therefore, is an effort to use the insights from economics, management, and development literature into competition law analysis with a view to promote innovation, to the extent it conforms to socio-

economic realities, technological capabilities, and institutional capacity of emerging markets. Not only does this research contribute to the scant literature on the nature of competition law in developing countries, it also attempts to embody innovation within the competition assessment in developing countries– an exercise that has hitherto been taken up primarily in developed jurisdictions.

CHAPTER 2

A Conceptual Framework to Identify Dynamic Efficiency

(2015) 11(2-3) *European Competition Journal* 319-339.

Even though dynamic efficiency has a great potential to bring social welfare, it was not until recently that dynamic efficiency started impressing competition authorities in deciding the net effect of mergers, agreements and abuse of dominance practices on competition. The problem, however, is that there is a general confusion regarding the difference between static and dynamic efficiency. Also, there is no unanimously accepted holistic definition of dynamic efficiency. For the correct application of competition law it is, therefore, essential that competition law practitioners, both lawyers and economists, are able to correctly identify dynamic efficiency. This paper after analyzing several definitions of dynamic efficiency categorizes the definitions into four approaches and develops a conceptual framework. After ascertaining the limitations in each approach a holistic definition is suggested.

Introduction

Dynamic efficiency in general is concerned with innovation whereas static efficiency is concerned with reduction in cost. Competition in markets may achieve both these efficiencies and thus foster welfare. However, there are trade-offs between static and dynamic efficiencies and the policy choice between them is difficult.[1] While the

[1] Even though a substantial body of mainstream economic literature favours dynamic efficiency over static efficiency, it was not until recently that dynamic efficiency started finding mention in competition analysis. See, Guidelines (EC) OJ C31/03 of 05 February 2004 on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings (Guidelines);

former may promote welfare in the short run, the latter fosters relatively more welfare but in the long run. Thus, there is a policy choice between lower prices in the short run, and relatively higher prices that may foster innovation resulting in better and new products in the long run. There is no unanimously agreed upon definition of dynamic efficiency. Economists are generally concerned with the concept of efficiency. The contours and limitations of definitions of several forms of efficiencies may not be of much importance to them. On the other hand, non-economists too use various efficiencies loosely. Gilford and Kurdle have observed that, and rightly so, that unlike economists, courts, policymakers and lawyers are often not careful in their use of terms like _efficiency' or _economic efficiency'.[2] Thus, a 2012 OECD report warns that even though there may be a wide consensus amongst the antitrust scholars and practitioners on the inclusion of efficiency gains, the competition authorities may make an error in the application of the concept of efficiency.[3] This warrants an orientation of legal practitioners to the economic concepts of efficiency. This article, written by a lawyer, is an effort to seek clarity on the framework of dynamic efficiency. It is not an attempt to pigeonhole various types of efficiencies. Rather, this is an endeavour to devise a conceptual framework to identify and separate static and dynamic efficiencies in view of the increasing reliance of competition agencies on the latter.

Article 2(1)(b) of Council Regulation (EC) 139/2004 of 20 January 2004 on the Control of Concentrations between Undertakings (the ECMR) [2004] OJ L24/1.

2 Daniel J. Gifford and Robert T. Kudrle, _Rhetoric and Reality in the Merger Standards of the United States, Canada, and the European Union'(2005) 72(2) Antitrust Law Journal 423.

3 © OECD (2012), The Role of Efficiency Claims in Antitrust Proceedings, <http://www.oecd.org/competition/Efficiency Claims 2012.pdf> accessed on 19 June 2014.

Part I of the paper is a general primer on the concepts of efficiencies and the trade-off between various efficiencies. This part also justifies the inclusion of dynamic efficiency gains in the competition law assessment. Part II — the core of the paper — analyses various different definitions of dynamic efficiency given by economists and policy institutions. These definitions are categorised into four approaches based upon the view they take of dynamic efficiency. After identifying the limitations of every approach a holistic definition is proposed.

1. Different types of efficiencies and the trade-off between them

Before the paper delves deeper into the concepts in order to provide a conceptual framework to identify dynamic efficiency and differentiate it from allocative efficiency, it will be practical to begin with the basic definitions of various kinds of efficiencies for the sake of understanding.

1.1. Meaning and definition of different types of efficiencies

A 2007 International Competition Network (ICN) report states that promoting efficiency is one of the aims of competition law. However, the question is what does efficiency actually imply? The report notes, "efficiency is a broad economic term that may refer to allocative efficiency (allocation of resources to their most efficient use), productive efficiency (production in the least costly way), or dynamic efficiency (rate of introduction of new products or improvements of products and production techniques)."[4] In very simple terms, these efficiencies can

[4] The Unilateral Conduct Working Group, "Report on the Objectives of Unilateral Conduct Laws, Assessment of Dominance / Substantial Market Power and State Created Monopolies" (6th Annual Conference of the International Competition Network, Moscow, May 2007), <http://www. internationalcompetitionnet work.org/uploads/library/ doc353.pdf> accessed on 18 June 2014. [hereinafter 2007 ICN Report].

be understood as: allocative efficiency— resources are allocated to the production of only those goods and services that are most desirable in the society.[5] This efficiency is achieved when firms produce output up to the point where the marginal cost of each unit just equals the value of that unit to consumers. At this point goods and services are supplied to those buyers who value them most highly; productive efficiency —forces firms to cut their costs in order not to lose sales to more efficient rivals. Productive efficiency depends upon the existing technology and resource prices[6]; dynamic efficiency— stimulates investment and innovation.[7] Central to the concept of dynamic efficiency is the phenomenon of innovation. Jorde and Teece define innovation as ―the search for, and the discovery, development, improvement, adoption and commercialization of new processes, new products, and new organizational structures and procedures".[8] Allocative and productive efficiencies are together termed as static efficiency.

1.2.The trade-off between static and dynamic efficiency

Miguel de la Mano argues that ―in general, allocative, productive and dynamic efficiencies cannot be simultaneously realised".[9] There may be trade-offs between allocative and

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5 Graham Bannock and R.E. Baxter, The Penguin Dictionary of Economics (8th edn, Penguin Group 2011) 111.

6 Miguel de la Mano, ‗For the customer's sake: The competitive effects of efficiencies in European merger control', (2002) Enterprise Papers No. 11.

7 For a more detailed discussion on these efficiencies the reader is directed to appendix, A taxonomy of Efficiencies, in the paper written by William J. Kolasky and Andrew R. Dick, ‗The Merger Guidelines and the Integration of Efficiencies into Antitrust Review of Horizontal Mergers'(2003) 71 Antitrust Law Journal 207.

8 Thomas M. Jorde and David J. Teece, ‗Innovation and Cooperation: Implications for Competition and Antitrust' (1990) 4(3) The Journal of Economic Perspectives 75.

9 Miguel de la Mano (n 6).

productive, and static and dynamic efficiencies. For example, a merger may lead to rise in market power. A higher market power provides the firm with the ability to increase the prices. On the other hand, this merger may lead to reduction in marginal cost as the merging firms may achieve economies of scale or scope. This is a trade-off between allocative and productive efficiency, which is very well demonstrated in Williamson's model.[10] Similarly, there are trade-offs between allocative and dynamic efficiencies. For example, a merger may increase the resources to invest in R&D that may result in innovation. But, at the same time increased market power may be detrimental for allocative efficiency.[11] Two real life examples will clarify the trade-off between various efficiencies. In 2007 Ryanair, a low cost airline, wanted to acquire Aer Lingus, the Irish flag carrier. [12] At the time of the decision by the European Commission, Aer Lingus and Ryanair were in direct competition with each other on 35 routes to and from Ireland. On 22 of these routes, the merger would have resulted in a monopoly. On the remaining routes, Aer Lingus and Ryanair were each other's closest competitors and the merger would have resulted in a joint market share of 60 per cent. Thus, there was a fear that the proposed merger would result in higher prices and reduced choices, resulting in allocative inefficiency. In this case Ryanair had asserted that merger will allow the parties to achieve efficiency through ~~"o~~operational cost savings" in the form of savings in staff costs, aircraft ownership costs, maintenance costs, airport charges and ground operational costs, ancillary sales and, finally, distribution efficiencies.[13] Thus, there was a trade-

[10] Oliver E. Williamson, _Economics as Antitrust Defense: The Welfare Tradeoffs' (1968) 58(1) The American Economic Review 18.

[11] For trade-offs, see in general Miguel de la Mano (n 6).

[12] Ryanair/Aer Lingus (Case COMP/M.4439) Commission Decision of 27 July 2007, 3104.

[13] Role of Efficiency Claims (n 3).

off between allocative and productive efficiencies. Eventually, the European Commission prohibited this takeover.[14]

A trade-off between allocative and dynamic efficiency may be seen in the case of mandatory Local Loop Unbundling (LLU). LLU refers to the process of requiring incumbent telecom operators to open, wholly or in part, the last mile of their telecommunications networks to competitors.[15] On one hand artificially induced competition brings down the prices for consumers—thus, resulting in allocative efficiency. On the other hand, as several researchers have found, LLU adversely affects investment and innovation in the telecom sector.[16]

1.3.In defense of Dynamic Efficiency

It is difficult to quantify dynamic efficiency.[17] Further, dynamic efficiency gains often materialise in the future. Therefore, the balancing of long term dynamic efficiency gains against short term allocative efficiency losses may be

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[14] European Commission, Mergers: Commission prohibits Ryanair's proposed takeover of Aer Lingus, European Union - IP/07/893 (27/06/2007) <http://europa.eu/rapid/press-release_IP-07-893_en.htm> accessed on 17 June 2014.

[15] International Telecommunication Union, Birth of broadband,(2003) <http://www.itu.int/osg/spu/publications/sales/birthofbroadband/BoBexecsumm.pdf> accessed on 23 June 2014.

[16] Hans Friederiszick, MichałGrajek and Lars-HendrikRöller, 'Analyzing the relationship between regulation and investment in the telecom sector'(2008) ESMT European School of Management and Technology, 7; MichałGrajek and Lars-Hendrik Roller, 'Regulation and Investment in Network Industries: Evidence from European Telecoms', (2012) 55(1) Journal of Law and Economics 189; Philip G. Gayle and Dennis L. Weisman, 'Efficiency Trade-Offs in the Design of Competition Policy for the Telecommunications Industry'(2007)6(3) Review of Network Economics.

[17] IK Gotts and CS Goldman, 'The Role of Efficiencies in M&A Global Antitrust in Review: Still in Flux?' in BE Hawk (ed.) International Antitrust Law & Policy: Annual Proceedings of the Fordham Corporate Law Institute (Juris Publishing Inc, Huntington 2003).

difficult.[18] This may explain as to why dynamic efficiency has not found favour with competition agencies.

Miguel de la Mano argues that innovative activity may yield higher consumer satisfaction through cheaper, better or new goods.[19] Dynamic efficiency in general is good for the economy as whole and leads to rise in living standards. Several economic studies support the claim that dynamic efficiency brings more social welfare than static efficiency. Robert Solow, who is known for his path-breaking work in the growth theory that won him the Nobel Prize, showed that 90 per cent of the increase in per capita output between the years 1909 and 1949 in the US was due to the technological change which averaged 1.5 per cent per year.[20] In an oft cited paper, Grossman and Helpman concur with Schumpeter and Solow to hold that improvement in technology is the real reason behind rising standards of living.[21]Audretsch et al., basing their reliance upon the work of Austrian economists in the area of industrial organization, argue that the existing enchantment of competition policy with static efficiency is misplaced.[22] They note that ~~in~~ a dynamic economy competition in product and process innovations may have a more

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[18] Christian R. Fackelmann, _Dynamic Efficiency Considerations in EC Merger Control: An Intractable Subject or Promising Chance for Innovation‘ (2006) University of Oxford, Centre for Competition Law and Policy Working paper No. L-09/06, <http://ssrn.com/abstract= 910465> accessed on 18 June 2014.

[19] Miguel de la Mano (n 6).

[20] Robert M. Solow, 'Technical Change and the Aggregate Production Function‘ (1957)39(3) The Review of Economics and Statistics 312.

[21] Gene M. Grossman and Elhanan Helpman, _Endogenous Innovation in the Theory of Growth‘ (1994) 8(1) The Journal of Economic Perspectives 23.

[22] David B. Audretsch, William J. Baumol and Andrew Emmet Burke, _Competition policy in dynamic markets‘, (2001) 19(5) International Journal of Industrial Organization 613.

significant effect on welfare".[23] This prescription is valid even for developing countries. Singh argues that a competition policy which has dynamic efficiency at the center is good for developing countries as well for the purpose of economic development.[24] Scholars have argued that there is now a consensus that innovation has a significant effect on productivity at the level of the firm, industry and country.[25]

The recognition of dynamic efficiency gains by economists has slowly started impressing the competition authorities in decision making. Many competition scholars have argued that allocative efficiency alone should not be the aim of the agencies; rather, the cardinal aim of competition policy should be to promote dynamic efficiency as maximum social wealth is achieved by dynamic efficiency.[26] The

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[23] ibid; See also, Phil Evans, 'In Search of the Marginal Consumer: The FIPRA Study', (2008) FIPRA Group. Evans suggests that long-term consumer interest is safeguarded only by an economy founded on innovation and efficiency; Joseph F. Brodley, 'The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress' (1987) 62 New York University Law Review1020. Brodley argues that 'of the three types of efficiencies, innovation efficiency provides the greatest enhancement of social wealth, followed by production efficiency, with allocative efficiency-the main focus of current enforcement efforts-ranking last."

[24] Ajit Singh, 'Competition and Competition Policy in Emerging Markets: International and Developmental Dimensions', (G-24 Discussion Paper Series, No. 18, September 2002) <http://unctad.org/en/docs/gdsmdpbg2418_en.pdf> accessed on 19 June 2014.

[25] G. Cameron, 'Innovation and Economic Growth', (LSE Center for Economic Performance Discussion Papers, No. 277, February 1996) <http://eprints.lse.ac.uk/20685/1/Innovation_and_Economic_Growth.pdf> accessed on 19 June 2014.

[26] Brodley (n 21); See also, Michael E. Porter, 'Competition and Antitrust: Toward a Productivity-Based Approach to Evaluating Mergers and Joint Ventures' (2001) 46 Antitrust Bull 919. Porter notes that 'productivity growth is central because it is the single most important determinant of long-term consumer welfare and a nation's standard of living".

competition agencies are now more willing to accept that ―behavior which is anticompetitive in the static context may be procompetitive in a dynamic one"[27]. One US case where dynamic efficiency played a significant role was the acquisition of Novazyme by Genzyme. The FTC closed its investigation of this 2001 acquisition taking into account dynamic efficiency gains as the firms would combine their synergies resulting from acquisition, which would lead to increased chances of development of a new drug for the treatment of Pompe disease.[28] Emerging competition regimes such as India also have mention of dynamic efficiency gains in the competition legislation while assessing whether a combination will have appreciable adverse effect on competition.[29] Apart from mergers, dynamic efficiency concerns may arise in agreements and abuse of dominance or monopolisation cases as well.

The issue of innovation acquires all the more significance in the post financial crisis world as innovation may be the key to recovery from the downturn. A 2009 OECD report argues this point and notes that several countries have given due weight to innovation in their stimulus packages.[30] Paunov argues that since long term growth prospects of a country

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[27] Jorde & Teecen (8).

[28] Federal Trade Commission, ‗FTC Closes Its Investigation of Genzyme Corporation's 2001 Acquisition of Novazyme Pharmaceuticals', Federal Trade Commission <http://www.ftc.gov/opa/2004/01/genzyme.htm. > accessed on 16 June 2014; For an analysis of the case see, Douglas L. Wald and Deborah L. Feinstein, ‗Merger Enforcement in Innovation Markets: The Latest Chapter — Genzyme / Novazyme', (2004) The Antitrust Source.

[29] Indian Competition Act 2002,Section 20(4) (l).

[30] © OECD (2009), Policy Responses to the Economic Crisis: Investing in Innovation for Long-Term Growth, Paris, <http://www.oecd.org/sti/42983414.pdf> accessed on 14 June 2014. This report gives the example of Finland and Korea. Both of these countries increased spending in R&D which helped them tied over the crisis.

depends upon innovation— which requires significant investment— reduction in investment in innovation because of the global crisis will delay the recovery.[31] However, firms have cut down investment in research and development because of reduction in overall budget due to the crisis.[32] It has been observed that investment in innovation seems to be procyclical and may reduce during recession.[33] Based on a survey of Latin American firms, Paunov looked at the innovation performance of the firms during the global crisis and found that one in four firms stopped innovation projects due to the global crisis.[34]Archibugi et al. also, through the analysis of a European survey, found that financial crisis reduced the number of firms willing to increase their innovation investment from 38 to 9 per cent.[35]

2. The framework to identify dynamic efficiency

This part looks into the several definitions of static and dynamic efficiencies. As will be demonstrated below there is no unanimity on the understanding of dynamic efficiency. This part analyses these definitions and classifies them into four approaches. No approach alone can capture the meaning of dynamic efficiency. After ascertaining the limitations of each approach a holistic definition of dynamic efficiency has been proposed.

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31 Caroline Paunov, ‗The Global Crisis and Firms' Investments in Innovation'(2012) 41(1) Research Policy, 24.

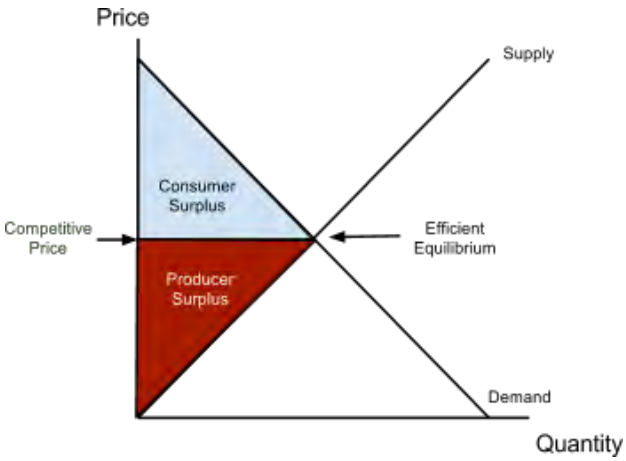
32 ibid.

33 Policy Responses – OECD, (n 30).

34 Paunov (n 31).

35 Daniele Archibugi, Andrea Filippetti and Marion Frenz, ‗The Impact of the Economic Crisis on Innovation: Evidence from Europe' (2013) 80(7) Technological Forecasting and Social Change 1247.

2.1. Similarities between productive and dynamic efficiencies in terms of their effect on supply curve



Before we look at the distinction between static (mainly productive) and dynamic efficiencies, it will be instructive to understand the similarities between these efficiencies for the purpose of clarity. Sherer notes that, ―from the standpoint of those who stress the desirability of allocative efficiency, triangle EFG (represents ‗deadweight loss') is what antitrust is all about."[36] Barnett also argues that static efficiency is concerned with minimising deadweight loss.[37] Referring to allocative efficiency, such as curbing ‗double markup problem' in vertical mergers, Barnett explains that ―within a given production technology and demand conditions, the most efficient output is where the marginal cost of production equals the value of the product to the marginal consumer (price equals marginal cost)."[38] He also

[36] F.M. Sherer, ‗Antitrust, Efficiency and Progress' (1987) 62 New York University Law Review 998.

[37] Thomas O. Barnett, ‗Maximizing Welfare Through Technological Innovation' (2008) 15 George Mason Law Review 1191. See also, J. Gregory Sidak and David Teece, ‗Dynamic Competition in Antitrust Law' (2009) 5 (4) Journal of Competition Law & Economics 581.

[38] ibid.

argues that productive efficiency and dynamic efficiency shift the supply curve out.[39] Productive efficiency enables the firms to maximize the output at a particular cost. Whereas, dynamic efficiency, through the introduction of new ways/means reduces the production cost.[40] It could also be argued that dynamic efficiency— in terms of better products— shifts the demand curve out as consumers find themselves willing to pay more for the same good, thereby increasing the consumer surplus. One conclusion we may draw from this discussion that both productive efficiency and dynamic efficiency in terms of cost reduction of the same products shift the supply curve out.

2.2. Broad and Narrow view of dynamic efficiency

Miguel de la Mano identifies that ―dynamic embodies two related but distinct components, a time dimension and the notion of change."[41] The time dimension implies that efficiency gains will materialise in the future, and the notion of change implies innovation. For example, Miguel de la Mano provides the following definition of dynamic efficiency— ―Dynamic efficiency in *antitrust economics* is connected to whether appropriate incentives and ability exist to increase productivity and engage in innovative activity over time, which may yield cheaper or better goods or new products that afford consumers more satisfaction than previous consumption choices".[42] This is a broader approach that takes into account both dimensions, time and innovation. On the other hand some economists have taken a narrower approach to dynamic efficiency by predominantly stressing innovation. For example see this definition by Motta— ―dynamic

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39 ibid.

40 See, N. Gregory Mankiw and Mark P. Taylor, ‗Microeconomics' (2nd Edition, South-Western Cengage Learning, 2011), 78-79.

41 Miguel de la Mano (n 6) footnote 14.

42 ibid.

efficiency…refers to the extent to which a firm introduces *new* products or processes of production."[43]It will be seen in the following text that even the broader definition does not provide a comprehensive framework to identify all kinds of dynamic efficiencies. For example, economies of scale in R&D post-merger is treated as dynamic efficiency gain even though no new product or process comes into existence post-merger. The merger merely gives an ability to innovate. Also, Learning by Doing (LBD hereinafter), in itself, does not lead to a new product or process, although the results accrue over a period of time. There are other questions as well regarding the bright line distinction between static and dynamic efficiencies. For example, as opposed to economies of scale and scope in R&D, economies of scale and scope in production are considered static efficiency gains. Arguably, the gains from economies of scale and scope in production may be invested in further research. After analysing different definitions adopted by several institutions and economists, an attempt has been made to categorise them in various approaches. As will be seen, there is no comprehensive legal definition or framework that may clearly define or distinguish productive and dynamic efficiencies.

2.2.1. Approach A- when the difference between static and dynamic efficiencies is only of time

As seen above, there are two elements in dynamic efficiency—time and innovation. There are definitions which predominantly focus upon the former. For example consider this statement by OECD — "The key difference between the two concepts (static and dynamic efficiency) is the relevant time horizon over which these efficiencies display their effects".[44] One obvious question, then, will be

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[43] Massimo Motta, 'Competition Policy: Theory and Practice' (1st edn., Cambridge University Press, 2004) 55.

[44] Role of Efficiency Claims (n 3).

what is the time horizon? The same paper by OECD goes on to clarify that, ―in the case of static efficiencies firms (and consumers) are observed at a particular point in time, like in a snapshot. The technology with which goods are produced is also assumed to be fixed, i.e. not subject to change".[45]

This fascination with time factor may be misleading. Some efficiencies that are considered productive may take some time to materialise. A merger may lead to productive efficiency; however, the gains from cost savings may not be passed on to consumers in terms of lower prices. But, as the merged entity faces competition from other firms, in future it may start reducing the prices.[46] In this situation, it cannot be said that gains from static efficiency materialise instantly or at one point. This statement by Röller et al. affirms that some economies of scale may materialise in future ― ―economies of scale, realised through a merger, may be the result of co-ordination of the (formerly separate) firms' investments in physical capital―called long-run economies of scale. Other realisations of economies of scale may, however, come already in the short run (when physical capital is held fixed)."[47]

In the mentioned case, one may confuse the productive efficiency gains with dynamic efficiency, if the sole

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[45] ibid.

[46] Andrew Tepperman and Margaret Sanderson, Innovation and Dynamic Efficiencies in Merger Review' < http : / / www. competitionbureau. gc.ca/eic/site/cb-bc.nsf/eng/02376.html>. In footnote 12 of the report the authors argue that ―If innovations are expected to diffuse rapidly to other market participants, the returns from innovation would likewise be expected to be competed away in a short time." Likewise, how sooner or later productive efficiency benefits consumers depends upon the competitiveness of a firm's competitors.

[47] Lars-HendrikRöller, Johan Stennek and Frank Verboven, Efficiency Gains from Mergers', The Research Institute of Industrial Economics, Working Paper No. 543, 2000.

criterion to differentiate between static and dynamic efficiencies is time. Further, technology with which goods are produced can also not be the pivotal point of distinction, as in the case of dynamic efficiency as well, such as LBD, the technology may remain the same.

2.2.2. Approach B- Static efficiency gains materialise only once whereas dynamic gains are recurring

The OECD policy brief paper on ‗Mergers and Dynamic Efficiencies' defines static efficiencies as ―static efficiencies are those which occur only once – going from two managing directors to one; or eliminating some production sites because both firms had plants that were running well below capacity levels"[48]. Productive efficiency is said to be achieved with the reduction in cost of production. This reduction may happen at once, for example at the time of merger. When the cost savings are one time saving they are productive efficiency gains. On the other hand, if the cost savings are recurring and materialise in the future they are dynamic efficiency gains― ―whereas static efficiencies relate to a particular point in time, dynamic efficiencies relate to evolutionary forces like R&D, which can occur and have effects in multiple time periods."[49] The Bureau of Competition (Canada) in its Merger Enforcement Guidelines (2011) gives some examples of productive efficiencies, such as economies of scale; economies of scope; economies of diversity; savings that flow from specialisation, the elimination of duplication, reduced downtime, a smaller base of spare parts, smaller inventory requirements and the avoidance of capital expenditures that would otherwise

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[48] ©OECD (2008), Mergers and Dynamic Efficiencies<http://www.oecd.org/daf/competition/mergers/41359037.pdf> accessed on 19 June 2014.

[49] © OECD (2007), Dynamic Efficiencies in Merger Analysis, DAF/COMP(2007)41 < http://www.oecd.org/competition/mergers/40623561.pdf> accessed on 19 June 2014.

have been required; savings that arise from plant specialisation, the rationalisation of various administrative and management functions (e.g., sales, marketing, accounting, purchasing, finance, production), and the rationalisation of research and development activities; and savings that relate to distribution, advertising and raising capital.[50] A scrutiny of these examples shows that these gains happen once, mostly at the time of merger. The OECD paper on dynamic efficiency in mergers[51] lists following as dynamic efficiencies—learning by doing, upgrading management, combining complementary distribution or marketing assets, elimination of duplicative R&D, economies of scale and scope in R&D, joint exploitation of intellectual property, better R&D risk spreading, better IP enforcement, increased financial resources with which to fund R&D, standard-setting, Schumpeter effect. Let us scrutinise the definition of dynamic efficiency provided by Van den Bergh and Camesasca ―Dynamic efficiency is achieved through the invention, development and diffusion of new products and production processes that increase social welfare. Whereas productive efficiency and allocative efficiency are static notions, progressiveness or dynamic efficiency refers to the rate of technological progress."[52] We see that the first dimension of dynamic efficiency, i.e., innovation is clearly present. However, as regard the second dimension, time, there is a little confusion. Static notion implies happening of an event at a particular point of time. The authors have juxtaposed this idea with 'rate of technological progress'. This means, that event is recurring in nature.

[50] Merger Enforcement Guidelines, (2011) para 12.16 < http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf /eng/03420.html#foot note 58b> accessed on 14 June 2014.

[51] Dynamic Efficiencies ―OECD (n 48).

[52] Roger J. Van den Bergh and Peter D. Camesasca, 'European Competition Law and Economics: A Comparative Perspective' (2nd edn, Sweet & Maxwell, 2006) 30.

This implies, as per the authors, there are several time frames associated with dynamic efficiency. However, it is not correct to say that dynamic efficiency gains are recurring in nature. An R&D process may lead to a new product or process only once. Financial resources that may fund R&D may increase significantly post-merger. These gains occur only once, for example at the time of merger.

2.2.3. Approach C- Dynamic efficiency pertains to the arrival of 'new' product or process as a result of innovation

A closer look at the productive efficiency gains makes it clear that the gains arise out of existing capabilities, tangible or intangible, which lead a firm to efficient scale of production and thereby cut production costs (thus, the technology remains constant). Contrary to this, dynamic efficiency results from the arrival of a new or improved product or process in terms of quality or reduced cost. Van den Bergh and Camesasca note that dynamic efficiency in its broad sense includes both productivity increase and product innovation.[53] Productivity increase may, however, be attributed to several other factors such as efficiently using the existing resources, employing expert labourers, rationalisation of production post-merger etc. However, productivity increase in order to be categorised as dynamic efficiency must be the result of new technology or process which is different from the previously employed technology or process. Stressing on innovation may be a key element in order to determine the true nature of any efficiency. Introduction of new ideas which is an exogenous element determines innovation which is the key element of dynamic efficiency.[54] It is also a matter of debate what products and processes qualify to be termed _new' or _improved'. I will return to this question towards the end of this section

[53] ibid 30.

[54] See Suzanne Scotchmer, _Innovation and Incentives', (1st Edn., The MIT Press, 2006). As per Scotchmer ideas are exogenous.

(2.2.3.). However, if we rely solely upon innovation then LBD does not qualify to be a dynamic efficiency gain as no ‗new' product or process ever comes in to existence.

Klein defines static efficiency as ―fine-tuning whose objective is to make best use of existing information" and dynamic efficiency as ―changing the production function in profitable directions".[55]Ghemawat and Costa also define static and dynamic efficiency, in essence, similarly, ―static efficiency,…involves continuous search for improvements within a fixed set of initial conditionsand dynamic efficiency,…involves continuous reconsideration of initial conditions."[56] These definitions stress a very critical aspect of productive efficiency—productive efficiency pertains to existing level of knowledge where initial conditions are fixed. Miguel de la Mano notes that ―allocative and productive efficiency are static notions concerned with the performance of an economy, industry or firm at a given point in time, for a given technology and level of existing knowledge".[57] Thus, in the process of its operations, if a firm acquires new information/knowledge which makes it more efficient, it is not a static efficiency gain. It is worth noticing that introduction of exogenous ideas and increase in knowledge are two different things. While, introduction of a new idea (which is the essence of innovation) is exogenous, increase in knowledge/information is an endogenous development. In his seminal paper Kenneth J. Arrow shows that intertemporal and international shifts in production functions can be explained

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[55] B. H. Klien, ‗Prices, Wages and Business Cycles: A Dynamic Theory', (1984, New York). As quoted in PankajGhemawat and Joan E. Ricart I Costa, ‗The Organizational Tension between Static and Dynamic Efficiency' (1993) 14 Strategic Management Journal, Special Issue: Organizations, Decision Making and Strategy 59.

[56] Ghemawat and Costa, (n 55).

[57] Miguel de la Mano (n 6).

by an endogenous theory of knowledge.[58] By knowledge Arrow implies learning. The OECD paper on dynamic efficiency in mergers defines LBD as ―learning by doing is simply what happens when firms get better at what they do by gaining experience doing it. Over time, they may learn new ways to minimize their costs or make improvements to their products"[59]. Regardless of the different nomenclatures used for LBD such as ―learning curve'', ―progress ratio'' or ―learning", they all refer to the same process through which firms become more efficient by accumulating knowledge that facilitate lower costs or higher productivity.[60]

An example will clarify how learning by doing brings efficiency endogenously. Kazuhiro Mishina in his paper examined the Boeing plant that manufactured the B-17 bomber during World War II and noted that labour time per airframe in 1944 fell to almost one-tenth of that three years earlier.[61]Mishina argues that the skill of workforce deteriorated considerably as the skilled workers enlisted or were promoted to supervisory positions. It implies that the increase in productivity was not due to specialisation as skilled labourers were no longer present.[62] He also shows

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58 Kenneth J. Arrow, ―The Economic Implications of Learning by Doing', (1962) 29(3) The Review of Economic Studies, 155.

59 Dynamic Efficiencies, OECD (n 48).

60 Salvador Barrios and Eric Strobl, ―Learning by Doing and Spillovers: Evidence from Firm-Level Panel Data' (2004) Review of industrial organization 175.

61 Kazuhiro Mishina, ―Learning by New Experiences: Revisiting the Flying Fortress Learning Curve', in Naomi R. Lamoreaux, Daniel M. G Raff, and Peter Temin (eds), ―Learning by Doing, in Markets, Firms and Countries', (University of Chicago Press, 1999) 145-184.

62 Kazuhiro Mishina (n 61), Mishinanotes that ―During the four years Boeing produced the B-17s in high volumes, the unit direct labor hours declined from roughly seventy-one worker-years to eight worker-years. The magnitude involved here is clearly too large to be explained by skill improvement. In Plant No.2 the bulk of labor savings appeared to originate from the hours in which direct skill was not being applied in

that economies of scale was not the reason behind increase in production. This example offers an insight into the difference between gains from specialisation and learning by doing. Learning by doing is a result of hands on experience, where the work force becomes productive over a period of time. Wright attributes cost reductions and increase in quantity to "the improvement in proficiency of a workman... less changes to disconcert the workman ... greater spread of machine and fixture set up time . . . ability to use less skilled labor as more and more tooling and standardization of procedure is introduced"[63].

Also, learning by doing is not only limited to the specialisation gained over a period of time, it also relates to how efficiently the existing resources are used by learning from experience. Learning by doing has two components—first, increase in the specialisation gained over time. Or, the way Smith puts it, increase in dexterity in every particular workman; and second, more efficient use of existing resources.[64]

Bahk and Gort term LBD as a by-product of production of goods and services.[65] They divide LBD into three components according to their nature.

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the first place. The key was instead throughput-time reduction and the operating know-how that enabled it."

[63] T.P.Wright, "The Effect of quantity production on cost", (1936) as quoted in Kazuhiro Mishina (n 61).

[64] Explaining increase in productivity Adam Smith found following reasons- "first to the increase of dexterity in every particular workman; secondly, to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines which facilitate and abridge labor, and enable one man to do the work of many." Adam Smith, 'An Inquiry into the Nature and Causes of the Wealth of Nations' Edwin Cannan (ed) (University of Chicago Press, [1776] 1976) as quoted in Kazuhiro Mishina n (61).

[65] Byong-HyongBahk and Michael Gort, 'Decomposing Learning by Doing in New Plants' (1936) 101(4) Journal of Political Economy.

1. Labor learning- ―Workers' skills in specific tasks are enhanced through experience. Jobs become routinized through repetition and workers better adjusted to the jobs."
2. Capital Learning- ―This refers to the increases in knowledge about the characteristics of given physical capital. It encompasses engineering information that accumulates through experience on the tolerances to which parts are machined, on the use of special tools and devices, and on improvements in plant layout and the routing and handling of materials. As operation continues, information also accumulates on the true capacity of equipment, on required maintenance, on the ways to avoid breakdowns and malfunctions or minimize their effects, and on complementarities or interactions among capital inputs added at different points in time."
3. Organization Learning – ―The principal elements of organization learning may be summarized as follows: (i) the matching of individuals and tasks based on knowledge derived from experience of the capacities and limitations of employees (another aspect of the same process is the screening of personnel from external sources to assure the matching of individuals and tasks); (ii) accumulation of interdependent knowledge about production possessed by members of a team and not portable by any one member of the team; (iii) the development of interactions among employees, an example of which might be knowing whom to ask for help when problems arise; and (iv) managerial learning reflected in improved scheduling and coordination among departments and in the selection of external suppliers of services or products."

Reduction in human error is also learning by doing.

LBD is also different from diffusion of know-how. Lars-HendrikRöller et al. argue that diffusion of know how arises when merger between firms with different capabilities (technological or administrative) lead to a diffusion of knowledge across participants which expands the inferior firm's production frontier. Defining learning by doing they state, "learning by doing means that the firms' average costs are declining in their cumulative (past) output (as a measure of experience)".[66] They treat learning by doing as an example of diffusion of know-how. It is argued here that diffusion of know how is a static efficiency whereas learning by doing is dynamic in nature. In diffusion of know-how existing capabilities are exchanged as opposed to new knowledge that is learnt/acquired endogenously through learning by doing.

Adam Smith in his book Wealth of Nations observed that wealth is created by specialisation. In the famous pin factory example he showed how division of labor created more wealth. Röller et al. note that "long-run economies of scale may also arise because of the benefits from specialisation. Each worker can concentrate his or her efforts on certain specific tasks that can be implemented more efficiently."[67] Specialisation happens when production process is broken into many parts and each part is then done by specialised labourer. Contrary to this, learning by doing may also materialise by using the existing resources, including employees, in more efficient ways. Thus, the workers learn as they work.

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[66] Lars-HendrikRöller, Johan Stennek and Frank Verboven, "Efficiency Gains from Mergers' (2000) The Research Institute of Industrial Economics, Working Paper No. 543 ; Interestingly, Röller et al. have categorised diffusion of know-how under technological progress. Thus, technological progress is not always dynamic in nature.

[67] ibid.

This discussion explains that since LBD is an endogenous growth in knowledge, it is considered a dynamic efficiency gain.

2.2.3.1. What is a new product or process?

If the key element of dynamic efficiency is innovation, then it becomes pertinent to understand what innovation is. The following definition of innovation is provided by Oslo manual— —A technological product innovation is the implementation/commercialization of a product with improved performance characteristics such as to deliver objectively new or improved services to the consumer. A technological process innovation is the imple mentation/adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, human resources, working methods or a combination of these."[68]This definition of innovation stresses on one very critical aspect of innovation— ideas themselves do not constitute innovation. Ideas have to be implemented/commercialised.[69] Further, the concept of innovation is intricately related to introduction of novelty into the economic sphere.[70]

The issue of novelty has posed a challenge before the EU courts and academics alike. In the *IMS* case the ECJ while deciding the charges pertaining to refusal of supply held that the applicant needs to show that he ~~in~~tends to produce new goods or services not offered by the owner of

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[68] © OECD (2005),Working Party of National Experts on Scientific and Technology Indicators, ~~T~~he Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual, Third Edition".

[69] See, Suzanne Scotchmer (n 54). Scotchmer notes innovation requires ideas and incentives. While ideas are exogenous incentives are endogenous.

[70] Jan Fagerberg, _Innovation: A Guide to the Literature', in Jan Fagerberg, David C. Mowery and Richard R. Nelson, _The Oxford Handbook of Innovation', (OUP, 2005) 20.

the right and for which there is a potential consumer demand".[71] However, the ‗new product' test is not easy to apply in reality. Whereas, in certain cases it is easy to see that the proposed product will be new and different (for example in Magill), in other cases one may not be sure about the final product.[72] It is also not clear how different a product should be from the existing products in order to be termed as a ―new product". [73]Ahlborn et al. suggest an approach to determine a new product for the purposes of the implementation of the ECJ test (in Magill and IMS) ――[a] new product expands the market by bringing in at current prices consumers who were not satisfied before".[74] Alternatively, it may be argued that the key element should be consumer opinion, i.e. whether the consumers perceive

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[71] Case C-418/01, *IMS Health GMBH & Co. OHG v NDC Health GMBH & Co. KG*, [2004] ECR I-5039, para 49; This principle was first laid in the Magill case, ‗The appellants' refusal to provide basic information by relying on national copyright provisions thus prevented the appearance of a new product…which the appellants did not offer and for which there was a potential consumer demand', Case C-241-1/91 P, RTE & ITP v Commission, [1995] ECR I-743, para 54.

[72] Damien Geradin, ‗Limiting the Scope of Article 82 EC: What Can the EU Learn from the U.S. Supreme Court's Judgment in Trinko in the Wake of Microsoft, IMS, and Deutsche Telekom' (2004) 41 Common Market Law Review 1519. Geradin argues that the ‗new product' test as proposed in the IMS case is ‗absurd'.

[73] ibid. Geradin also argues that it was not appropriate for the court to deviate from the existing notion of substitutability and coin the concept of ‗new product'. In Geardin's view even if the proposed product has some degree of novelty it will qualify to be a ‗new product', this is certainly a low threshold set by the court which will eventually save competitors instead of competition in refusal to supply cases.

[74] Christian Ahlborn, David S. Evans, and A. Jorge Padilla, ‗The Logic and Limits of the ―Exceptional Circumstances" in Magill and IMS Health'(2005) 28 Fordham International Law Journal, 1109. Ahlborn et al. argue that a product which is merely a variant of an existing product is unlikely to expand demand, it rather shifts demands from an existing product. ‗A guide that is merely a variant of an existing guide is unlikely to expand demand significantly; more likely, it shifts demand from an existing guide.'

the product to have enough novelty. From the *Microsoft* case on tying, it is clear that the test to determine whether products are distinct to determine tying is consumer demand.[75] This rationale can be extended to determine whether the consumers perceive the innovated product as new. However, this approach has its own problems— product experience is specific to consumers and depends upon their aesthetic sense, habits and is also industry specific.

In patent laws invention is considered new if it does not form part of the state of the art. The state of the art comprises all matters made available to the public before the priority date of the invention by written or oral description, by use or in any other way.[76] In patent laws words of the claim determine if the patent is valid.[77]

In the 2008 *Microsoft* decision[78], the Commission relied upon the well-established patent jurisprudence in order to determine whether Microsoft's protocol were innovative.[79]

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[75] Case T-201/04*, Microsoft v Commission*, [2007] ECR II-3601, paras 917-922.

[76] See William Cornish and David Llewelyn, 'Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights', (5th Edn, Sweet & Maxwell, 2003) 176; see also, Rüdiger Rogge, 'The Concept of Novelty and European Patent Law' (IIC 1997) 443.

[77] Mark A. Lemley, 'Point of Novelty', (2011) 105 Northwestern University Law Review 1253; Mark A. Lemley, 'The Changing Meaning of Patent Claim Terms' (2005) 104 Michigan Law Review 101, 105.

[78] Commission Decision C(2008) 764 final of 27 February 2008.<http://ec.europa.eu/competition/antitrust/cases/dec_docs/37792/37792_3997_9.pdf> accessed on 19 June 2014.

[79] "If the protocol technology currently used by Microsoft, although different from protocol technology available in the public domain, is not novel, in the sense that it already forms part of the state of the art, or is obvious to persons skilled in the art (namely if there is no innovation in the Interoperability Information), Microsoft should not be entitled to charge for such protocol technology." Commission Decision C(2008) 764 final of 27 February 2008 (n 79) para 130.

This approach of the Commission was subsequently upheld by the General Court in its 2012 decision.[80] The novelty in patent laws is a judicially determined standard and the discretion of courts plays an important part.[81] Ahlborn et al. have rightly noted that ‗it is therefore a matter of judgment whether a product is a "new" one'.[82]

2.2.4. Approach D- Synergies that provide the ability or incentive to innovate are dynamic in nature

There is a fourth way to look at the distinction between static and dynamic efficiencies. This approach also includes the ability or incentive to innovate as dynamic efficiency. ―They (dynamic efficiencies) have recurring effects, which considerably enhances their potential impact on performance. In general, dynamic efficiencies are synergies that enable firms to improve their performance on a potentially continuing basis. Efficiencies that enhance the ability or incentive to innovate, for example, are considered dynamic".[83] This approach explains why elimination of duplicative R&D, economies of scale and scope in R&D, joint exploitation of intellectual property, better R&D risk spreading, better IP enforcement, increased financial resources with which to fund R&D and standard-setting qualify as dynamic efficiency. This approach will also qualify fixed cost saving (apart from savings for R&D) as dynamic efficiency, in those cases

[80] Case T-167/08 *Microsoft Corp. v European Commission*, < http : // curia. europa. eu / juris / document / document. jsf? text= & docid= 124434&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=2322513> accessed on 19 June 2014

[81] Suzanne Scotchmer and Jerry Green, ‗Novelty and Disclosure in Patent Law' (1990) 21(1) The RAND Journal of Economics 131-146.

[82] Ahlborn et al. (n 74).

[83] Mergers and Dynamic Efficiencies (n 48); See also, © OECD Policy Brief (2008)<http://www.oecd.org/daf/competition/mergers/41359037.pdf>accessed on 14 June 2014. It argues ―efficiencies that enhance the ability or incentive to innovate, for example, are considered dynamic".

where it has the potential to enhance the ability to innovate by providing surplus capital. There may be cases when a merger reduces fixed costs substantially (for example by providing access to IPRs).

In general, if a merger reduces variable cost it is considered to be static efficiency as it leads to lower prices which are passed on to the consumers.[84] Prima facie, gains in fixed cost are not passed on to the consumers in terms of lower prices. For example, in the *Drug Wholesalers* case the question was whether savings resulting from elimination of duplicative distribution centers should count in favor of the merger. The court refused to take such efficiencies into account and rather held that these efficiencies may give rise to anticompetitive price increase.[85]The Canadian Competition Bureau, however, considers fixed cost savings as part of any efficiency claim.[86] The treatment of fixed cost saving seems to be changing in the US as well. The FTC and DOJ have asserted in Merger Guidelines Commentary to take into

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[84] Guidelines (n 1).

[85] See George S. Cary, ‗Efficiencies in Merger Analysis: From Both Sides Now Testimony to the Antitrust Modernization Commission', (17 November 2005) Testimony to the Antitrust Modernization Commission, <http : // govin fo. library. unt. edu/ amc/ commission_ hearings/ pdf/ Statement_ Cary_ final. pdf> accessed on 14 June 2014.

[86] Andrew Tepperman and Margaret Sanderson, ‗Innovation and Dynamic Efficiencies in Merger Review', (2007) Competition Bureau, Canada <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02376.html> accessed on 14 June 2014, The authors argue that ―Both variable and fixed cost savings are relevant to the analysis because both generate producer surplus (even though it is recognized that generally only variable (i.e. marginal) cost savings lead to price reductions).‖ The authors have quoted Mergers Enforcement Guidelines (Canada) (2004). Richard Elliott and Mark Katz have argued that in 'Superior Propane' both fixed and variable costs were taken into account in the trade offanalysis, see ―Canada: what have we learnt in 20 years?", (2006) 9(6) <http://www.dwpv.com/~/media/Files/PDF/Elliott-Katz_Paper_-_20_Years_-_GCR_June_2006.ashx> accessed on 14 June 2014.

account merger specific fixed-cost savings, even if they do not bring short term procompetitive price effects as consumers may benefit in the long run.[87] There is a potent reason to take into account fixed cost savings especially in technology intensive industries. Carry argues that in technology intensive industries marginal costs of products are trivial. Thus, variable cost efficiencies may not be beneficial to consumers.[88] The Antitrust Modernization Committee final report recommends that certain fixed-cost efficiencies "such as research and development expenses, in dynamic, innovation-driven industries where marginal costs are low relative to typical prices" should be given due weightage in efficiency analysis.[89]

Another reason to take fixed cost savings into account is that determination of fixed or variable cost depends upon time. Kolasky argues that "fixed cost savings matter….First, which costs are variable depends in part on how long our time horizon is. With a longer horizon, costs that might otherwise appear fixed may indeed impact marginal pricing decisions."[90]Mankiw and Taylor also share the same opinion, "A firm's costs often depend on the time horizon being considered. In particular, many costs are fixed in the short run but variable in the long run.

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87 US Department of Justice and Federal Trade Commission, 'Commentary on the Horizontal Merger Guidelines' (2006) 58<http://www.ftc.gov/sites/default/files/attachments/merger-review/commentaryonthehorizontalmergerguidelinesmarch2006.pdf> accessed on 14 June 2014.

88 George S. Carry (n 85).

89 Antitrust Modernization Commission, 'Report and Recommendations' (2007), <http://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf> accessed on 14 June 2014.

90 William J. Kolasky, 'The Role of Economics in Merger Enforcement: Efficiencies and Market Definition under Conditions of Price Discrimination', (Charles River Associates Conference, "Current Topics in Merger & Antitrust Enforcement", Washington DC, Dec. 11, 2002).

As a result, when the firm changes its level of production, average total cost may rise more in the short run than in the long run".[91]

There is one more reason to take fixed cost savings into account—lower fixed costs may motivate firms to undertake more R&D work.[92] Since fixed cost savings in some cases increase the financial resources to undertake R&D, it may be considered as dynamic efficiency gain. However, there are certain qualifications—the firm has to prove that savings in fixed cost will be diverted to R&D, and also firms cannot easily get money for R&D from financial markets.[93]

2.3.The Closest definition

As we see there are several approaches and definitions but they do not provide a comprehensive framework to identify and distinguish between static and dynamic efficiencies. Combining all approaches together the following definition comes closest to the concept of dynamic efficiency— Dynamic efficiencies are related to the ability of a firm and its incentives to introduce new products or processes of production (or to improve existing ones) *by adopting new technology or enhancing knowledge endogenously*, i.e. to —move the efficient frontier of production faster or further forward. Dynamic efficiencies are therefore linked to innovation, learning by doing and

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[91] N. Gregory Mankiw and Mark P. Taylor, ‗Economics' (2nd Edition, South-Western Cengage Learning, 2011), 283.

[92] Dynamic Efficiencies – OECD (n 48). This paper quotes Katz and Shelanski- ―it is important that fixed costs not be summarily excluded from the efficiencies analysis when innovation is at issue", Michael Katz & Howard Shelanski, Mergers and Innovation, (2007) 74, Antitrust Law Journal 1, 3; See also, US Antitrust Modernization Commission, Report and Recommendations, (2007)<http://apps.americanbar.org/antitrust/at-committees/at-s1/pdf/developments/amc-s1.pdf> accessed on 20 June 2014.

[93] For this suggestion I am thankful to Professor Jan Boon, Tilburg School of Economics and Management, Department of Economics.

research and development (R&D) activity; contrary to static efficiencies, then, they display their effects *generally* over time.[94]

If we rely upon this approach then combining complementary distribution or marketing assets (as a result of merger) does not qualify to be a dynamic efficiency gain, as the process is not new and firms merely bring in their comparative advantages together by way of integration.[95] This is merely a ‗synergy'. As per Farrell and Shapiro ‗synergies' are ―efficiencies based upon the close integration of specific, hard-to-trade assets owned by the merging parties".[96] This integration leads to lower costs or improved quality. They contrast this with ‗efficiencies without synergies' such as ‗rationalisation' of output between the operations of two merging firms.[97] The essential difference between these two concepts is that ‗efficiencies without synergies' may be achieved by one firm even without a merger.[98] An example of non-synergy efficiency may be economies of scale. Both ‗synergies'

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[94] I have modified the following definition provided by OECD in its paper, The Role of Efficiency Claims in Antitrust Proceeding (n 3) - ―Dynamic efficiencies are related to the ability of a firm and its incentives to introduce new products or processes of production (or to improve existing ones), i.e. to ―move the efficient frontier of production faster or further forward (Motta, 2004, 55). Dynamic efficiencies are therefore linked to innovation, learning by doing and research and development (R&D) activity; contrary to static efficiencies, then, they display their effects over time."

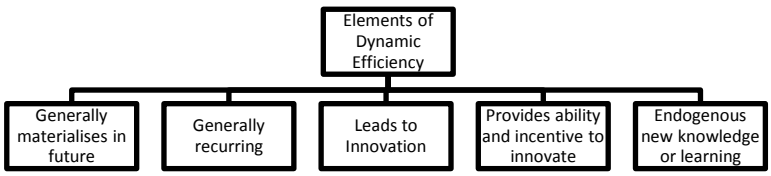
[95] The OECD paper on dynamic efficiency in merger analysis treats combining complementary distribution or marketing assets as dynamic efficiency. See, Dynamic Efficiencies – OECD (n 48).

[96] Joseph Farrell and Carl Shapiro, ‗Scale Economies and Synergies in Horizontal Merger Analysis' (2001) 68(3) Antitrust Law Journal (Farrell and Shapiro). See also, Joseph Farrell and Carl Shapiro, ‗Horizontal Mergers: An Equilibrium Analysis'1990 80(1) American Economic Review 107-126.

[97] Farrell and Shapiro (2001) (n 96).

[98] ibid.

and ‗efficiencies without synergies' are productive efficiencies as they cut the cost of production by using alternative combination of resources. In this process the technology is kept constant.



3. Conclusion

Competition law is an economic law. Its theories, application and evolution depend upon economic theories. There has been an acceptance of more economics based approach in competition law lately. As lawyers share the equal responsibility to correctly apply competition law, it is important that they (lawyers) understand the economic arguments. On the other hand, economists too should attempt to appreciate the fascination of lawyers with issues such as clarity and certainty. Keeping this mutual cooperation in mind, this paper has attempted to bring in legal clarity to the concept of dynamic efficiency by developing a framework.

The motivation behind this paper was the great deal of confusion that a competition law lawyer encounters in identifying and separating dynamic efficiency from static efficiency (mainly productive efficiency). The paper has argued that faced with a trade-off between static and dynamic efficiency, the latter should be duly taken into account while assessing the anti-competitive effects of mergers, agreements or abuse of dominance cases as several researchers have shown that dynamic efficiency brings more social welfare as compared to static efficiency. Further, stressing on dynamic efficiency is all the more required in the post-crisis world as innovation is the key to

recovery. The focus of the paper, however, was to arrive at a holistic definition of dynamic efficiency. The methodology employed to develop this framework is simple — based upon several existing definitions of dynamic efficiency four approaches are identified. Each approach has its limitations and exceptions. After analysing all the approaches one holistic definition/ framework has been suggested.

CHAPTER 3

Access and Investment in the ICT Sector for Developing Countries

(2015) 9(1) *Law and Development Review* 1-27

The Information and Communication Technology (ICT) sector is characterized by rapid changes in technology. The innovation in the ICT has shown its benefits in not only facilitating better communications, but also in fostering development. Therefore, ensuring proper incentives to the private sector for innovation or diffusion of technology is crucial. However, incentivizing the private players may be challenging in developing countries, where majority of the population requires cheap access. Thus, this paper analyses the extent to which developing countries can ensure incentivizing the providers of technology, without failing on their commitment to provide cheap access to the poor. The paper analyses Local Loop Unbundling (LLU) and Universal Service Obligation (USO) and suggests ways to ensure adequate investment without jeopardizing access. The framework chosen in this paper is to see the changing treatment of LLU and USO in mature jurisdictions, and then analyze the viability of these policies in the socio-economic settings of developing countries. The framework also takes note of changes in the ICT technology.

Introduction

The Information and Communication Technology (ICT) sector is characterized by fast changing technology. Each new generation offers better and more efficient mode of communication. In view of the benefits of the new technology, therefore, it is imperative that the policy promotes the adoption and diffusion of the latest

technology, by ensuring right incentives to the providers of the technology. There is one additional benefit of providing new ICT technology in the developing countries–it allows developing countries the opportunity to leapfrog the old technology.[1] On the other hand, developing countries also have to ensure cheap access to a large part of population.[2] Thus, the challenge is to understand the viability and limitation of incentivizing investment in light of different socio-economic background in each individual developing country.

Midgley defines economic development "as a dynamic process that creates wealth and raises standards of living".[3] As opposed to economic development, social welfare is a

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1 Robert Davison, Doug Vogel, Roger Harris and Noel Jones, „Technology Leapfrogging in Developing Countries - An Inevitable Luxury?", Electronic Journal of Information System in Developing Countries, (2000) 1, 5 , 1-10. They define leapfrogging as "The specific use of IT to accelerate development and promote economic growth is often referred to as technology leapfrogging: the implementation of a new and up-to-date technology in an application area in which at least the previous version of that technology has not been deployed."; Jeffrey James, „Leapfrogging in mobile telephony: A measure for comparing country performance", Technological Forecasting & Social Change 76 (2009) 991–998. Jeffery James argues "it is developing countries with the least commitment to the older technological infrastructure that potentially have the most to gain from the transition to a new paradigm".

2 For the purpose of this paper, the definition of developing countries is based on the World Bank classification. See „How does the World Bank classify countries?",<https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries> accessed 24 July 2015, The world bank terms low and middle-income economies as developing countries. However, it also gives the caveat– "the term *developing* used to denote all low- and middle-income countries in this context does not imply that all economies in the group are experiencing similar levels of development or that other economies have reached a preferred or final stage of development."

3 James Midgley, „Growth, Redistribution, and Welfare: Toward Social Investment" [1999] 73 Social Service Review 3-21.

"mechanism for redistributing this wealth to fund social services for the poor and the oppressed."[4] Measuring development in terms of economic growth is a narrow conception. As has been argued, development is increasingly seen as a process of social transformation.[5] Martinussen notes that there is no consensus on the definition or understanding of economic development; however, the following definition has received wide approval lately — "economic development is *a process whereby the real per capita income of a country increases over a long period of time while simultaneously poverty is reduced and the inequality in society is generally diminished*- or at least not increased".[6] Therefore, the concept of development is broad and incorporates social welfare as well. This paper will follow this broad understanding of development.

In general, promoting investment in new ICT technology by developing countries may be questioned, as there is a large part of the population that still needs to have basic access.[7] Economic development, even when seen as a broader concept that goes beyond GDP growth and per capita income, is fostered by investment in the new ICT technology. As will be argued, improved ICT services

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4 ibid.

5 Innovation and the Development Agenda, OECD, 2010 (Erika Kraemer-Mbula and Watu Wamae eds.) <http://www.idrc.ca/EN/Resources/Publications/openebooks/501-4/index.html#page _40> accessed 19 June 2014.

6 John Martinussen, Society, State& Market: A Guide To Competing Theories of Development (5th edn, London: Zed 2005) 37.

7 For an account of special economic characteristics of developing countries that may have bearing on the nature of policies including competition law and policy see Simon J. Evenett, „Competition law and the economic characteristics of developing countries", in Michal S. Gal et al (eds). *The Economic Characteristics of developing jurisdictions: Their Implications for competition law* (Edward Elgar 2015) page no. 15

have positive impact on health, education, corruption reduction, poverty alleviation etc. For example, Cecchini and Scott, in a paper written in 2003, have documented how ICT is helping to alleviate poverty in rural India by improving poor people‟s access to education, health, governance and financial services.[8]

This paper analyzes two specific policies (Local Loop Unbundling and Universal Service Obligation) that have bearing on investment and argues for protecting and promoting investment in the ICT sector. The paper also provides solutions for ensuring access and equity without jeopardizing the adoption of new technology. Since there are differences among developing countries there cannot be a universal policy prescription for the developing world. The policy recommendations of this paper, however, may serve as a starting point. Part I of the paper discusses how investment in the new ICT services is positively related to social welfare. This part also explains the importance of investment for innovation and diffusion of new technology. Further, it also analyses the substitutability between wireline and wireless telephony as changing technology affects policy. Part II analyses two specific policies― Local Loop Unbundling (LLU) and Universal Services Obligation (USO) ― which have bearing on investment in the ICT sector, and proposes solutions for encouraging investment without failing on the commitment to provide easy access to the ICT. The methodology chosen is to understand these two policies in more mature jurisdictions of the US and EU and analyze the viability in the socio-economic settings of a developing country. The

[8] Simone Cecchini and Christopher Scott, „Can Information and Communications Technology Applications Contribute to Poverty Reduction? Lessons from Rural India‟ (2003) 10 Information Technology for Development 73-84 <http://ssrn.com/abstract= 904333> accessed 19 June 2014.

analysis also takes note of changing ICT technology that may affect the policy choice.

1. Investment in network improvement and social welfare

Investment in the new ICT technologies leads to societal welfare. For example investment in new technologies such as 3G and 4G improves the quality of life by creating new jobs.[9] Shapiro and Hassett estimate that every 10 per cent increase in the adoption of 3G and 4G wireless technologies could add more than 231,000 new jobs to the US economy in less than one year.[10] A World Bank study found that for every 10 percentage point increase in high-speed internet connections, there is an increase in economic growth of 1.38 percentage points for developing countries.[11]

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[9] Robert J. Shapiro and Kevin Hassett, „The Employment Effects of Advances in Internet and Wireless Technology: Evaluating the Transitions from 2G to 3G and from 3G to 4G" (*NDN and New Policy Institute*, January 2012) <http://www.sonecon. com/ docs/studies/Wireless_Technology_and_Jobs-Shapiro_Hassett - January_2012.pdf> accessed 15 July 2014. They argue that, "new econometric analysis set forth in this study shows that the investments and innovation entailed in the transition from 2G to 3G wireless technologies and Internet infrastructure spurred the creation of some 1,585,000 new jobs from April 2007 to June 2011."

[10] ibid. "The research found that a 10 percentage point gain in penetration of a new generation of wireless technology in a given quarter leads to a 0.07 percentage-point gain in employment in the following quarter and continuing gains in subsequent quarters. These results suggest that a national job creation strategy should include or encourage appropriate measures to accelerate the deployment of 4G infrastructure."

[11] C.Z.W. Qiang and C.M. Rossotto, Economic Impacts of Broadband, in *Information and Communications for Development 2009: Extending Reach and Increasing Impact*, World Bank (2009), Washington D.C., 35-50.

There are strong societal and private benefits of 4G products and services such as public safety management of crisis situations like natural disasters, health care delivery, and the distribution and use of energy.[12] The health care gains of broadband are noteworthy. Qiang et al. note how broadband-enabled telemedicine is benefiting remote areas relying upon technologies such as videoconference.[13] They quote an interesting example of Arvind Eye Hospital in Tamil Nadu, India which by using wireless broadband, that provided 100 times faster speed than dial-up network, connected five of its rural clinics in 2004 to provide eye services to rural residents. The high-speed enabled the doctors to provide Web camera consulting to 1500 patients each month.[14]

Telecom also provides a platform technology that is used by other industries in manufacturing and services.[15] That means a faster and efficient broadband will bring more innovation and efficiency in other sectors. Deployment of 4G technology in recent times have one more added advantage ―Shapiro and Hassett argue that rapid deployment of 4G technology and the accompanying innovation may also lead to stronger economic recovery and expansion from the recent recession.[16]

Thus, investment in improved ICT technology has positive effects on social welfare and economic growth. On the other hand socio-economic realities in the developing world make any attempt to promote investment in the ICT

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12 Shapiro and Hassett (n 9).

13 Qiang and Rossotto (n 17). The authors have very well elucidated various benefits of broadband in developed and developing countries.

14 ibid.

15 Johannes M. Bauer and WoohyunShim,„Effects of Regulation on Innovation in the Information and Communications Sector", (2012) <http://ssrn.com/abstract=2028523 or http://dx.doi.org/10.2139/ssrn.2028523> accessed 15 July 2014.

16 Shapiro and Hassett (n 9).

sector difficult, as there are strong voices that demand that prices are kept low to support redistribution. Or, can there be an alternative approach that allows for a middle path between access and investment in the ICT sector? In Part II certain issues that pose a dilemma with respect to making a choice between access and investment have been analyzed. However, before that it becomes important to understand the changing role of regulation in the telecom sector.

Eli Noam notes that the telecom sector has experienced three generations so far.[17] The first two stages were followed by suitable regulation. The first generation was marked by state owned monopoly on copper analog system. The regulation was thus tailored to cooperate with the monopolist in spreading the services, but at the same time keeping a check on its market power. A need was felt to introduce more competition in the second generation. Thus, it resulted in privatization and liberalized entry in the telecom sector. This was achieved through regulation that induced competition. It was believed that competition would lead to innovation. Empirically also it was found that competition had a positive effect even in developing countries.[18] Finally, the current, third generation, is characterized by the arrival of fiber-optic and high capacity wireless access networks which will provide speed in the gigabit range. The biggest challenge in this generation is to

[17] Eli M. Noam, „Regulation 3.0 for Telecom 3.0" [2010] 34 Telecommunications Policy 4-10.

[18] Scott J. Wallsten, „An Econometric Analysis of Telecom Competition, Privatization, and Regulation in Africa and Latin America" [2001] 49 The Journal of Industrial Economics 1-19. "Wallsten in his econometric analysis of the effects of telecommunication reforms in developing countries found that competition (as measured by the number of mobile operators in the country not owned by the incumbent) is significantly associated with increase in the per capita number of telephone mainlines, payphones, and connection capacity, and with decrease in the price of a local call."

balance the need of an advanced network infrastructure with other important policy goals such as providing access, especially when the financial cost of fiber upgrade to rural area is substantial. Noam argues that the second generation regulation is not fit for the third generation technology in the telecom sector *inter alia* because of growing investment requirements.[19] Several economists have also shown, as argued in Part II, that providing easy access to the competitors to advanced networks of incumbents will slow down investment and innovation in the ICT sector. The choice between providing cheaper access to consumers and ensuring investment in the new technology becomes more difficult, as several studies have found a positive correlation between increase in broadband Internet access and growth in GDP.[20]

1.1. Investment for innovation and diffusion of new technology in the telecom sector

Innovation is a multi-stage process where ideas are transformed into new/improved products, services or processes.[21] It has two important components: ideas and implementation of the ideas. Innovation in the mobile telephony may take place in three different segments— applications for the handsets, core network and handsets. Innovation in the core sector may increase spectral efficiency. Spectral efficiency means the quantity of bits (i.e., information) that can be transmitted permegahertz

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19 Noam (n 17).

20 For an overview of such studies see Tim Kelly and Carlo Rossotto, „Broadband Strategies Handbook" (*World Bank*, 2012) <http://broadbandtoolkit.org/Custom/Core/Documents/Broadband%20Strategies%20Handbook.pdf> accessed 15 July 2014. Kelly and Rossotto also note "a comprehensive study regarding the effect of broadband on GDP in developing countries is warranted".

21 Anahita Baregheh, Jennifer Rowley and Sally Sambrook, „*Towards a multidisciplinary definition of innovation',* (Management Decision, 2009 vol 47 issue 8) 1323-1339.

(Mhz) (i.e., bandwidth) of spectrum.[22] Spectral efficiency results in increased capacity to make voice calls and increased speed to access internet and download information using less spectrum.[23] Since, wireless telephony is on the rise all over the globe, technological innovation is required to increase spectral efficiency. Some scholars argue that next generations wireless will have the technological capability to offer the same bit rates as are offered by the wireline presently.[24]

Spectrum is a limited natural resource; thus, investment is needed in order to find ways to optimize the use of spectrum but at the same time not affect the quality of services provided. So far as fixed telephony is concerned, Digital Subscriber Line (DSL) technology requires investment to increase the transmission capacity and to split the traffic into data and voice.[25] Also, cable TV infrastructure requires investment that may permit reverse flow of data.[26] Investment is also required to rollout new fiber optic. Investment in the ICT sector, even when it is not directed at innovation but at spreading the new technology is important, as it has been argued above that the new ICT technology promotes social welfare. It is true that local ICT firms in the developing countries are still not taking up enough R&D; however, adequately incentivizing

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22 Gerald R. Faulhaber and David J. Farber, „Innovation in the Wireless Ecosystem: A Customer Centric Framework" (2010) 4 International Journal of Communication 73-112.

23 ibid.

24 Tim Kelly and Carlo Rossotto (n 20) 229.

25 ITU note that even now xDSL accounts for over half or more than five out of every ten fixed broadband lines. See, The State of Broadband 2014: Broadband for all, A report by the Broadband Commission, September 2014.

26 Gordon Klein and Julia Wendel,„The Impact of Local Loop Unbundling Revisited", 25th European Regional Conference of the International Telecommunications Society (ITS), Brussels, Belgium, 22-25 June 2014.

the ICT sector in general will have at least two benefits. Firstly, incentivizing the ICT providers will ensure faster adoption of the latest technology. Secondly, the developing countries will benefit from the innovative technology as much as the developed countries. Of course, such incentives are subject to the socio-economic realities in the developing world as will be seen in Part II.

Faulhaber and Farber note that investment and innovation are two sides of the same coin as investment is required in order to materialize new ideas, new technologies and new business methods.[27] No investment can happen unless there are incentives for innovators and investors.[28] With respect to the telecom industry, not only providing access at near marginal cost and overlooking the huge sunk cost is detrimental, but also since the telecom industry is characterized by rapidly changing technology and economics, the investment incentives of incumbents may be significantly lower if competitors are artificially allowed access.[29] The telecom sector requires huge investment (see Table 1). The perfect competition model that calls for prices that are equal to marginal cost is not viable for this sector.[30] Further, incentives to innovate decrease as returns to innovation become more uncertain.[31] Over The Top (OTT) services such as VoIP are also

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[27] Gerald R Faulhaber and David J. Farber, „Innovation in the Wireless Ecosystem: A Customer-Centric Framework" (March, 19, 2010). International Journal of Communication, Vol. 4, 2010. <http://ssrn.com/abstract=1574966> accessed 15 July 2014.

[28] ibid.

[29] Jerry Hausman, The Effect of Sunk Costs in Telecommunications Regulation (James Alleman & Eli Noam, The New Investment Theory of Real Options and its Implication for Telecommunications Economics ed, 1999) 191-204.

[30] ibid.

[31] ibid.

eroding the revenue basis of telecom operators making it difficult for them to invest in R&D.[32]

Table 1: Estimates of Network Investment Needs for Different Regions.

Region/Country	Amount	Comments	Source
Latin America & Caribbean	US$ 355 million	Next-generation networks	AHCIET
MENA	EUR 0-25 billion	Estimated for 10 Mbps for 100% of population and 30 Mbps for 50% of population, using a combination of FTTC and LTE technologies.	World Bank
Europe	EUR 180–270 bn	To achieve Digital Agenda targets	EC
Europe	EUR 82 bn	Universal Next-generation Access	Point Topic

Source: The State of Broadband 2014: Broadband for all, A report by the Broadband Commission, September 2014.

In the telecom sector, regulation follows the technological changes which may occur at a very fast pace. The technological progress in mobile telephony has added new dimensions to the telecom sector. In several developing countries mobile phones have outnumbered fixed lines. Thus, a forward-looking regulatory telecom policy depends a lot upon the issue of substitutability between wireless and wireline telephony. If wireless and wireline are found to be substitutes for each other, it may result in substantial policy changes. Therefore, before analyzing the policies that have an effect on investment, in the following text it will be seen if the new wireless technologies may substitute fixed wireline telephony in developing countries.

1.2. Are wireless and wireline telephony in the same market in the developing countries?

Wireless may provide the same services as wireline telephony. The difference merely concerns the speed

[32] Martin Peitz , Heike Schweitzer and Tommaso Valletti, „Market Definition, Market Power and Regulatory Interaction in Electronic Communications Markets" (2014), CERRE study <http://www.cerre.eu/sites/cerre/files/141029_CERRE_MktDefMktPwrRegInt_ECMs_Final.pdf> accessed on 17.02.2014

provided by these technologies. Thus, this paper for the purpose of ascertaining substitutability between wireless and wireline considers all kinds of services—voice, video and data — provided by wireless and wireline telephony. The criterion to ascertain if wireline and wireless are in the same market is to see to what extent consumers in developing countries find wireless to be a substitute of wireline telephony — this is the relevant market test in the competition law parlance.[33] Rather than carrying out the SSNIP test, the paper looks at the qualitative differences along with changing user pattern in developing countries to gauge substitutability. It is important to note that substitutability between wireless and fixed telephony matters only in the local loop, as generally the backbone is fixed infrastructure, be it copper or fiber. The local loop is considered to be a natural monopoly where constructing a parallel network is socially wasteful.

Very often high-speed internet is referred to as broadband. However, there is no common definition of broadband. Kelly and Rossottonote that "due to each country's unique needs and history, including economic, geographic, and regulatory factors, definitions of broadband vary widely".[34] They also note that traditionally broadband has been defined on the basis of data transmission speed. Thus, technically, both wireless and wireline may qualify as broadband depending upon the data transmission speed chosen as threshold. Aside from mobility, there are other differences between wireless and wireline telephony. Lehr and Chapin view capacity limits as the most important fundamental difference between wired and wireless networking. They observe that a single coaxial cable has a useful frequency range in order of 1 GHz, while a single

[33] For market definition and the tests to identify relevant market see, Commission Notice on the definition of relevant market for the purposes of Community competition law (97/C 372 /03).

[34] Kelly and Rossotto (n 20) 3.

optical fiber has a useful frequency range of over 1000 GHz. Highlighting the limitations of wireless telephony, they note that the entire wireless RF spectrum (3 Hz to 300 GHz) can fit easily in a single fiber.[35] However, that much broadband is generally not required in the local loop. Another disadvantage of wireless is that raw data transmission in wired networks is generally much more reliable than in wireless networks.[36] However, the most crucial and useful benefit of wireless telephony is mobility. When seen together, this is the most critical aspect other than cheaper prices that determines the choice of consumers.

Several researchers have found mobile telephony as a substitute for fixed line.[37] A 1999 paper by Sidak et al. considers wireless and wireline as substitutes.[38] However, after network convergence this question becomes more complex as voice, video and data are transmitted together and the wireless suffers from capacity constraints, at least in some cases such as high-definition (HD) video.

In Austria, the telecommunications regulator determined in 2009 that DSL, cable modem, and mobile broadband

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[35] William H. Lehr and John M. Chapin, „On the convergence of wired and wireless access network architectures" (2010) 22 Information Economics and Policy 33-41.

[36] ibid.

[37] For a review of such literature see Michael R. Ward and Glenn A. Woroch, „Fixed-Mobile Telephone Subscription Substitution in the U.S.", University of Texas at Arlington, Department of Economics Working Papers 0501. Ward and Woroch also find that some degree of subscription substitution began to occur in the US as of 2001; See also Christopher Garbacza and Herbert G. Thompson Jr, „Demand for telecommunication services in developing countries" [2007] 31 Telecommunications Policy Volume 276–28. Garbacza and Thompson found that the even though several researchers have found wireless and wireline to be substitutes, the degree of substitutability varies.

[38] J. Gregory Sidak, Hal J. Singer and David J. Teece, „A General Framework for Competitive Analysis in Wireless Telecommunications", [1999] 50 Hastings Law Journal 1639-1672.

connections for residential consumers are substitutes at the retail level.[39] Yet there are others who are skeptical about the capacity of wireless to substitute wireline.[40] The International Telecommunication Union (ITU), at present, considers mobile broadband as a complement rather than a substitute for fixed services in those countries with widespread fixed broadband coverage.[41]Calvo also views fixed and wireless telephony as complementary in almost all cases, as in order for wireless to perform efficiently, it has to be supported by fiber backbone networks.[42] Also, he argues that in order to reduce demands on scarce spectrum, for some uses fixed networks may be used while scarce spectrum may be used by those who require mobility.[43] It is true that at present wireless does not provide the same speed as wireline; however, with the introduction of new mobile broadband technologies such as HSPA+, LTE, WiMAX, wireless broadband may become a suitable alternative for a fixed broadband connection rather than just a complement. ITU asserts that, "[T]o the extent that such services (HSPA+, LTE, WiMAX) exist in economies that can be classified as next generation broadband leaders, it might be appropriate to consider fixed and mobile broadband to be in separate markets".[44]

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39 Kelly and Rossotto (n 20) 117-118.

40 In its Open Internet Order, the FCC noted that the extent to which mobile wireless offerings will compete with wireline offerings is unknown. See Jeffrey A. Eisenach, „Broadband Competition in the Internet Ecosystem" [2012] AEI Economic Studies.

41 ITU, „Competition and regulation in a converged broadband world" (2013) <http://www.itu.int/ITU-D/treg/publications/ Competition regulation.pdf > accessed 15 July 2014.

42 A. G. Calvo, Universal Service Policies in the Context of National Broadband Plans, OECD Digital Economy Papers, No. 203, OECD, 2012 <http://dx.doi.org/10.1787/5k94gz19flq4-en> accessed 15 July 2014.

43 ibid.

44 ITU (n 41).

There is an alternative approach as well. This approach suggests that the extent to which mobile broadband technologies are complementary or substitutable for other broadband access technologies depends upon the specific market.[45] In a paper published in 2004, Banerjee and Ros find that technological substitution in some countries and economic substitution in others may explain differential patterns of development in global fixed and mobile telephony.[46] They note that "[t]echnological substitution is less likely to be observed, however, in developed countries where both mobile and fixed line services of acceptable quality are available simultaneously".[47] Wireless is easier and cheaper to deploy as compared to wireline.[48] As the cost and resources required for the deployment of wireline broadband are very high, wireless is a viable alternative for developing countries especially in rural and remote areas.[49] Such substitution has already begun. For instance, wireless broadband subscription in Sub-Saharan Africa is more than eight times the number of wireline subscriptions.[50] In India, out of a total of 895.51 million telephone connections, 864.72

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45 ibid.

46 Aniruddha Banerjee and Agustin J. Ros, „Patterns in global fixed and mobile telecommunications development: a cluster analysis" [2004] 28 Telecommunications Policy 107–132. "Arguably, good service quality, uniform technological standards, and the promises of next generation cellular technology have boosted subscribership for mobile services in some countries. In other countries, increasing affordability, convenience, problems that retard further development of existing fixed networks, and long waiting lists for fixed services have likely prompted potential telecommunications customers to look in mobile telephony"s direction."

47 ibid.

48 Kelly and Rossotto (n 20) 229.

49 ibid 19.

50 ibid 20.

million are wireless telephone connections.[51] In Morocco, third-generation (3G) mobile broadband connections surpassed asymmetric DSL (ADSL) wireline connections in September 2009.[52]

In the opinion of ITU, growth in mobile broadband connection is not merely a result of poor fixed network infrastructure. Along with changing usage patterns supported by mobile data cards and smartphones, 4G network provides substantial improvements in mobile technology as it offers substantially higher data rates.[53] ITU also argues that at present there are few services that would require substantially higher download speeds than mobile broadband can offer.[54] Tim Wu considers 4G as a replacement for fixed line network.[55] But, there is no consensus that 4G can be a substitute for fixed line telephony.[56]

The discussion above shows that even though there are technological limitations of wireless telephony in terms of matching the speed offered by fixed lines, even after the

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[51] Annual Telecom Report, 2012-13 < http: // www. dot. gov .in / sites /default/files/Telecom%20Annual%20Report-2012-13% 20 (English) % 20_ For%20web%20(1).pdf> accessed 15 July 2014.

[52] Kelly and Rossotto (n 20) 96. For the latest data about fixed and wireless telephony in different countries see, The State of Broadband 2014(n 25).

[53] ITU (n 41).

[54] ibid.

[55] Tim Wu, *Creeping Duopoly?*(Prepared Testimony Before the Subcomm. on Antitrust, Competition Policy and Consumer Rights of the Senate Judiciary Comm., Hearing on The Verizon/Cable Deals: Harmless Collaboration or a Threat to Competition and Consumers? 2012) 2.

[56] See, Jeffrey A. Eisenach, „Broadband Competition in the Internet Ecosystem" [2012] AEI Economic Studies. "Moreover, although many think that the next generation of 4G wireless services (based on LTE or WiMAX technology) will serve as an economic substitute for wireline broadband, there is not yet a consensus that that moment has arrived; hence, the wireline and wireless markets are often considered separately."

introduction of 4G telephony, wireless is substantially cheaper than rolling out fiber optics. This difference significantly influences the choice made by developing countries. Now, developing countries and to some extent even developed countries have started relying upon wireless telephony in the local loop, instead of choosing to spend exorbitant amount of money on spreading new fiber. This implies that particularly in developing countries wireless is largely considered as a substitute for wireline telephony in the local loop. Further, it also offers developing countries an opportunity to leapfrog the existing technology followed by developed countries.

1.2.1. Disruptive Innovation Analysis

As per Christensen, disruptive innovation is a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors.[57] Ever since Christensen‟s influential book on this issue, several researchers have tried refining and building on this theory.

Govindarajan and Kopalle identify, based upon the existing literature, following five features of disruptive innovations: (1) the innovation underperforms on the attributes mainstream customers value; (2) the new

[57] C.M. Christensen and J.L. Bower, „Customer power, strategic investment, and the failure of leading firms‟ (1996) Strategic Management Journal 17(3), 197; C.M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston, MA Harvard Business School Press, 1997); Dan Yu and Chang Chieh Hang, „A Reflective Review of Disruptive Innovation Theory‟ (2010) International Journal of Management Reviews 12 (4), 435; R. Adner „When are Technologies Disruptive? A Demand-based View of the Emergence of Competition‟ (2002) Strategic Management Journal 23(8), 667; Clayton M. Christensen, „The Ongoing Process of Building a Theory of Disruption‟, Journal of Product Innovation Management 23, 39.

features offered by the innovation are not valued by the mainstream customers; (3) the innovation typically is more simple and cheaper and is offered at a lower price than existing products; (4) at the time of its introduction, the innovation appeals to a low-end, price-sensitive customer segment, thus limiting the profit potential for incumbents; and (5) over time, further developments improve the innovation‟s performance on the attributes mainstream customers value to a level where the innovation begins to attract more of these customers.[58] As evident from the above literature, new wireless technology satisfies all these five features of disruptive innovation in developing countries. Thus, new wireless technology is disruptive in nature and has resulted in the shift from fixed to wireless in the local loop in developing countries.

2. Effect of Local Loop Unbundling (LLU) and Universal Service Obligation (USO) on investment and innovation and the choice for developing countries

Having answered the question regarding substitutability between wireless and fixed telephony, this part will look at two specific policies that affect investment in the ICT sector. The implementation of these policies will be analyzed in the socio-economic context of developing countries, taking account of technological changes in the ICT sector.

2.1. LLU in developing countries

LLU refers to the process of requiring incumbent operators to open, wholly or in part, the last mile of their telecommunications networks to competitors.[59] LLU allows

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[58] V. Govindarajan and P.K Kopalle„, The Usefulness of Measuring Disruptiveness of Innovations ex post in Making ex ante Predictions‟, (2006) Journal of Product Innovation Management, 23, 12.

[59] ITU, „Birth of Broadband‟ (2003) Geneva<http://www.itu.int/wsis/tunis/newsroom/stats/BirthofBroadband_2003.pdf>accessed 15 July 2014.

entrants to reach end-users by purchasing access from incumbents at the wholesale level. LLU was first adopted in the US in 1990s. The mandatory sharing of facility in the US was seen as a means to eventual competition between rival infrastructures.[60] It was considered a substitute to facility based competition, especially in those markets and areas where additional access network would not be economically viable.[61] Thus, the clear idea behind LLU was to introduce competition in the telecom sector.

LLU is a classic case of tension between allocative efficiency gains resulting in lower prices and dynamic efficiency gains resulting in investment and innovation, when there is a need for new infrastructure. While there are conflicting views and results regarding the impact of access regulation on investment in telecommunications, the majority of scholars agree that access regulations negatively affect the infrastructure investment.[62] In a paper written in 2005, Hausman and Sidak analyze the

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[60] Jerry A. Hausman and J. Gregory Sidak, „Did Mandatory Unbundling Achieve Its Purpose? Empirical Evidence From Five Countries", [2005] 1 Journal of Competition Law and Economics 173-246.

[61] Paul de Bijl and Martin Peitz, „Local Loop Unbundling in Europe: Experience, Prospects and Policy Challenges" Tilburg Law and Economics Center (TILEC) Discussion Paper, DP 2005-008.

[62] Hans Friederiszick, Michal Grajek and Lars - Hendrik Röller, *Analyzing the Relationship between Regulation and Investment in the Telecom Sector* (White Paper, Cm 108-01, 2008) <http://www.esmt.org/fm/13/WP-108-01.pdf> accessed 15 July 2014. They note that "the arguments that mandated access coupled with cost-based access charges undermine innovation have a relatively strong theoretical underpinning and include: i) Lowering the option value of the incumbent's investment, ii) Shifting the burden of risk from the entrant to the incumbent and iii) Increasing the incumbent's cost of capital". For a more recent study see, Robert W. Crandall, Jeffrey A. Eisenach , Allan T. Ingraham, „The Long-run Effects of Copper-loop Unbundling and the Implications for Fiber", Telecommunications Policy37 (2013)262–281.

unbundling rationales[63] in five countries (United States, United Kingdom, New Zealand, Canada, and Germany) and found that none of the four rationales were supported in practice.[64] Grajek and Roller in their empirical study found that access regulation discourages investment by incumbents and individual entrants, even as entrants‟ total investment increases. They also quantify the magnitude of loss resulting from access regulation at €16.4 billion over 10 years (1997-2006).[65] Gayle and Weisman argue that with respect to process innovation, investment in innovation increases when the unbundling obligation is relaxed.[66] Frieden also notes that LLU failed to foster competition in the US as many ventures fold, exit the market, or pursue other market opportunities.[67] So far as the diffusion of fixed broadband is concerned, Lee et al. found that LLU has a positive effect on diffusion of fixed broadband in OECD countries. However, they caution that the results of their study are specific to the OECD countries and thus may not be true for developing countries.[68]

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[63] There rationales are ―1. Competition in the form of lower prices and greater innovation in retail markets is desirable 2. Competition in retail markets cannot be achieved with mandatory unbundling 3. Mandatory unbundling enables future facilities-based investment ('stepping-stone' or 'ladder of investment hypothesis) 4. Competition in wholesale access markets is desirable.

[64] Hausman and Sidak (n 60).

[65] Michal Grajek and Lars-Hendrik Roller, „Regulation and Investment in Network Industries: Evidence from European Telecoms‟ [2012] 55 Journal of Law and Economics 189-216.

[66] Philip G. Gayle and Dennis L. Weisman, „Efficiency Trade-Offs in the Design of Competition Policy for the Telecommunications Industry‟ [2007] 6 Review of Network Economics.

[67] Rob Frieden, „Unbundling the local loop: a cost/benefit analysis for developing nation‟ [2005] 7 info 3 – 15.

[68] Sangwon Lee, Mircea Marcu and SeonmiLee, „An Empirical Analysis of Fixed and Mobile Broadband Diffusion‟ [2011] 23 Information Economics and Policy 227–233.

As the fixed-line telephony now has moved on to fiber from copper, LLU presents further difficulties. Kelly and Rossotto caution that LLU may be detrimental to fresh infrastructure investment such as rolling out new fiber optic.[69] Not only does access regulation reduce the incentives of the incumbent to invest in the facility, it also reduces incentives to build new infrastructure because infrastructure can be rented from incumbents at mandated prices.[70] The development of Next Generation Networks (NGNs) requires significant investment. As easy access, including LLU, impedes investment, the development of NGNs may be adversely affected by LLU. From the incumbent‟s point of view, instead of LLU, wholesale product such as bit stream access is preferable over unbundling as the incumbent retains its control over the physical line. Implementation of LLU or Wholesale Broadband Access (WBA) in general presents further difficulties. National Regulatory Authorities (NRAs) have to constantly oversee the process of LLU and determine the access cost. NRAs have to determine which elements the incumbent may share, and set a reasonable price that may induce competition without distorting the revenues of the incumbent that may adversely affect innovation, facilities investment and long term consumer benefit.[71] This may be very demanding for regulatory bodies in developing countries with limited resources.[72]

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69 Kelly and Rossotto (n 20) 117.

70 MichałGrajek and Lars-Hendrik Roller (n 65); See also Valletti M. Tommaso, „The Theory of Access Pricing and Its Linkage with Investment Incentives‟ [2003] 27 Telecommunications Policy 659–675.

71 Frieden (n 67).

72 Antonio Estache and Liam Wren-Lewis, „Toward a Theory of Regulation for Developing Countries: Following Jean-Jacques Laffont's Lead‟ [2009] 47 (3) Journal of Economic Literature, 729-770. Estache and Lewis argue that, “key aspects of institutional failure affecting regulation in LDCs can be grouped into four broad limitations: limited regulatory capacity, limited commitment, limited accountability, and limited fiscal efficiency”.

Unbundling in general is losing its viability. While it used to be a prominent policy choice in 1990s, it has now been phased out in the US. Europe, however, still continues to practice it.[73] The Federal Communication Commission (FCC) shunned the mandatory unbundling requirement in February 2003 with respect to new fiber-optic network; however, unbundling of the existing copper lines still continued.[74] Interestingly, this step was affirmed by the judiciary on the ground that unbundling would adversely affect investment.[75] The industry responded positively and announced an increase in investment.[76] The Financial crisis has, however, adversely affected investment in fiber optic. An ITU report, as early as 2009, had expressed fears that the crisis could delay rolling-out NGNs as some operators were cancelling their investment plans.[77] Further, 4G wireless telecom made investment in fiber non-viable. In 2012, the number of added lines per day was 16,703 that were 72 per cent less than the highest recorded growth in January 2006, and also 47 per cent less than 2009.[78]

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[73] Friederiszick et al. (n 62); See also Johannes M. Bauer and Erik Bohlin, „From Static to Dynamic Regulation: Recent Developments in US Telecommunications Policy" 43 Inter economics 38-50. "In the US, the goals of unbundling have changed over time from a narrow focus on stimulating market entry to a broader view of its implications for investment and innovation."

[74] Report and Order on Remand and Further Notice of Proposed Rulemaking, „Review of the Section 251: Unbundling Obligations of Incumbent Local Exchange Carriers" [2003] 18 FCC Rcd 16978.

[75] United States Telecom Association, et al. v. FCC & USA (D.C. Cir. 2004)

[76] Graeme Guthrie, „Regulating Infrastructure: The Impact on Risk and Investment" [2003] 44(4) Journal of Economic Literature 925-972. It was Verizon that announced its deployment of FTTP.

[77] ITU, „Confronting the Crisis: Its Impact on the ICT Industry", February 2009

[78] Broadband lines in the EU: situation at 1 July 2012, Communications Committee, Brussels, 18/02/2013DG CNECT/F4 .

In 2000 when the LLU was mandated in Europe, the legislators had a clear understanding that it should be used to deal with network monopolies, but as it reduces incentives to innovate and invest, it should be withdrawn when there would be sufficient competition.[79] However, LLU is still in practice in Europe. As per the European Commission, "empirical evidence shows that investment and innovation are strongest where there is effective competition between infrastructures. However, there is still no infrastructure-based competition on around 80 percent of the EU‟s local loops. This means that, ex-ante, regulation continues to play a crucial role in maintaining competition and protecting consumers by setting conditions for access to the incumbent‟s infrastructure".[80]

The policy choice to opt for LLU also depends upon competition between legacy infrastructures in a particular country. Kirsch and Hirschhausen have termed competition between DSL and cable TV as historic coincidence.[81] In several countries cable networks compete vigorously with DSL connections for broadband access.[82] The US and Canada started deploying cable in the 1940s and have extensive cable network. In those countries where cable and DSL compete (inter-platform competition), there are

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[79] European Parliament and Council (2000), "Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop", Official Journal of the European Communities L 336, 30.12.2000, 4-8. See also, Bijl and Peitz (n 61).

[80] Commission Staff Working Document, *Summary of the Impact Assessment* (Cm 473, 2007) <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52007SC1473&from=EN> accessed 15 July 2014.

[81] Fabian Kirsch and Christian von Hirschhausen, „Regulation of NGN: Structural Separation, Access Regulation, or No Regulation at All?" (2008) Communications & Strategies No. 69, 63.

[82] Peitz et al. (n 32)

incentives for the legacy networks to upgrade to NGNs.[83] It has also been observed that, in some countries strong inter-platform competition (as among DSL, cable and fiber) has resulted in strong intra-facility competition among fiber networks.[84] Thus, in such countries LLU is not the optimum solution as the fiber provider will not have a monopoly.

Unlike US, where cable TV network provides an alternative, several European countries only have DSL as the most common used infrastructure.[85] In the absence of the LLU, an upgrade to NGNs will allow the incumbent telecom operator to reap monopoly rent. Therefore, the EU still practices LLU.

The above mentioned path-dependence vis-à-vis LLU may not influence the policy choice in developing countries about LLU, in the absence of competition from alternative infrastructure such as cable.[86] However, as developing countries are leapfrogging to wireless technology in the local loop, unbundling is not the right policy choice.

Very often Ladder of Investment (LOI) is suggested as a technique to mitigate the negative effects of LLU. Ladder of investment is a technique, initially suggested by Cave[87], that

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[83] Tricia Ragoobar, Jason Whalley and David Harle, „Public and Private Intervention for Next-generation Access Deployment: Possibilities for three European countries", Telecommunications Policy35 (2011)827–841.

[84] ibid.

[85] Klein and Wendel (n 26)

[86] There are 100 million Indian households that have cable television connections. The government of India is deliberating over allowing the cable TV operators to provide broadband access. See BS Reporter, „Cable TV network to increase broadband penetration" Business Standard (New Delhi, 4 July 2014)

[87] Martin Cave, „Encouraging Infrastructure Competition Via the Ladder of Investment" [2006] 30 Telecommunications Policy 223–237; See also, Martin Cave and Ingo Vogelsang, „How Access Pricing and Entry Interact" 27 Telecommunications Policy 717-727; Martin Cave and Luigi Prosperetti„European Telecommunicat ions Infrastructures" [2001] 17(3) Oxford Review of Economic Policy 416-431.

seeks to strike a balance between short term (service based) competition and long term (facility based) competition. This technique involves providing entrants access at a charge that increases over time or by withdrawing access obligation, for example by setting a sunset clause, thus inducing them to invest in their own facility. Here, different levels of access are provided gradually, and at each level, as the customer base of the entrant increases, the entrant is encouraged to invest in network elements.[88] However, there may be difficulties for the regulators to see the development of facility based competition from service based competition. As Oldale and Padilla note "[R]egulators are unlikely to have the detailed knowledge that is required to micro-manage the investment ladder that could transform the service providers of today into the facilities-based competitors of tomorrow".[89] Vareda also argues that asymmetric information between the service-based entrants and the regulator may further complicate implementing the LOI.[90] Bourreau et al. argue that "[O]ne can only imagine how such informational asymmetries on the cost side would also complicate the implementation of the LOI. For example, when facing multiple potential entrants, potentially with different cost structures, determining the right sequence of rungs, as well as deciding on the time (and mechanism) at which to burn existing rungs would be extremely complicated."[91] Also, from a business perspective,

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[88] Marc Bourreau, Pınar Dogan and Matthieu Manant, „A Critical Review of the „„Ladder of Investment" Approach" [2010] 34 Telecommunications Policy 683–696.

[89] Alison Oldale and A.J.Padilla (2004), *The Pros and Cons of Antitrus t in Deregulated Markets* (Swedish Competition Authority (Ed.) 20 04) <http://www.kkv.se/upload/filer/trycksaker/rapporter/pros&con s/rap_pros_and_cons_deregulated_markets.pdf> accessed 15 July 2014.

[90] JoãoVareda, „Access Regulation Under Asymmetric Information About the Entrant"s Efficiency" [2010] 22 Information Economics and Policy 192–199.

[91] Bourreau et al. (n 88).

an investor will want to charge more initially rather than gradually increasing the rates of each rung.[92] Thus, there are problems with respect to the implementation of LOI, especially for the regulators in developing countries with limited resources. Bourreau et al. also note that in a symmetric market, i.e., when the incumbent and the entrant both have to invest in new infrastructure, such as in the case of rolling of new fiber optic, the utility of LOI is not clear at present and warrants more research.[93]

LLU is especially detrimental for developing countries where the local loop is still not totally built out.[94] Kelly and Rossotto note that LLU has not been widely implemented in developing countries as the base of installed wireline in developing countries is lower than the developed countries. They also argue that since the regulatory resources are limited in developing countries, the aim of regulatory policy should be to encourage facility based competition rather than spending scarce resources on LLU, as there are very few loops to unbundle.[95]

It cannot be denied that developing countries should have cutting edge technology in order to avoid the digital divide. Government spending on the development of NGNs is not a viable option for developing countries considering their lack of funds. Cave and Martin for the reasons of promoting equity, industrial policy requirement and economic recovery have argued for public investment in the NGN development.[96] However, the examples chosen by Cave and Martin ―Australia [with an investment A$43bn (€ 29 bn)], Singapore and New

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92 I am thankful to Professor Pierre Larouche for this insight.

93 Bourreau et al. (n 88).

94 Kelly and Rossotto (n 20) 117.

95 ibid.

96 Martin Cave and Ian Martin, „Motives and means for public investment in nationwide next Generation networks" [2010] 34 Telecommunications Policy, Volume 505–512; See also Tim Kelly and Carlo Maria Rossotto (n 26) 2.

Zealand [NZ$1.5bn (€780 m)] — are all developed countries. It is not viable, economically or politically, for developing countries to invest in the telecom sector. A weak financial market—post crisis—has already shaken the confidence of private players. Additionally, Over the Top (OTT) services are also eroding the profit base of telecom service providers. Faced with this situation, it is important to adopt such policies that may encourage private sector to invest in telecom sector.

In light of the recent technological advancement in mobile telephony the viability of LLU is all the more questionable. As opposed to fixed line telephony, mobile telephony is characterized by full-fledged facility based competition.[97] Grajek and Roller argue that even though it is expensive to duplicate the copper lines in a local loop, the natural monopoly feature of the fixed line networks is diminishing in view of the rise of alternative networks such as mobile telecommunications.[98] As has been argued in Part 1.2, technological advances such as introduction of 4G technology, especially in developing countries, have started providing a substitute for fixed line network (not only copper lines but optical fiber as well). Thus, removing bottlenecks through LLU in order to facilitate competition should not be the primary policy objective now for developing countries.

2.2. Universal Service Obligation in developing countries

In order to provide telecom access to rural areas, several countries have imposed USO. USO was traditionally financed through cross subsidies: low-cost and high-income consumers pay prices above cost to subsidize high-cost and low-income consumers, who pay prices below cost.[99] Gasmia

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97 Friederiszick et al. (n 62).

98 Grajek and Roller (n 65) foot note 8.

99 George R.G. Clarke and Scott J. Wallsten, „Universally bad service: Providing infrastructure services to rural and poor urban consumers" (World Bank Policy Research Working Paper, Cm 2868, 2002) 1–54.

et al. in their analysis find that cross-subsidies are preferable to explicit taxation of the urban sector for the financing of universal service in developing countries.[100] In the EU, the rationale behind providing universal service is preventing exclusion, both geographical and social. This can very well be the general objective behind universal service in developing countries as well. In the EU universal service promises, at least, access to a public telephone network at a fixed location, directory enquiry services and directories, free outgoing calls to emergency services and special and/or equivalent services for the disabled.[101]

USO is one of the thorniest issues in telecom policy. There are strong arguments from both supporters and opponents. Let us first have a look at the arguments that oppose USO. Wallsten argues that cross-subsidies are not an economically viable mode to provide universal service.[102] Competition on one hand may lower the cost of services; on the other, it may have a negative effect on the ability of the firms to cross-subsidize services.[103] It is true as competitors strike incumbent‟s high profit generating areas/services that generate funds to support cross-subsidization.[104] Therefore, USO, especially when the market is competitive, may discourage investment. Ramos et al. find that USO policy may be counterproductive, as even though it increases

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[100] F. Gasmi, J.J. Laffont and W.W. Sharkey, „Competition, Universal Service and Telecommunicat-ions Policy in Developing Countries‟ [2000] 12 Information Economics and Policy 221–248.

[101] Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

[102] Scott Wallsten, „Reverse Auctions and Universal Telecommunications Service: Lessons from Global Experience‟ [2009] 61 Federal Communications Law Journal 373.

[103] Clarke and Wallsten (n 99).

[104] © OECD, Universal Service Obligations in a Competitive Telecommunications Environment, Information Computer Communications Policy 38.

investment in rural areas, investment in urban area decreases.[105] USO also results in economic inefficiency.[106]

In view of rapidly changing technology, the telecom sector is in urgent need of investment. Not only does fiber optic requires huge investment, but also there is a need to increase broadband speed. High broadband speed in turn has been found to have a positive impact on growth.[107] Another prominent argument against cross-subsidies is that relatively wealthy benefit from them far more than the poor.[108] New disruptive innovation like Voice over Internet Protocol (VoIP) are also threatening the revenue base of telecom service providers that fund new technology and universal service provisions.

On the other hand there is a rich literature that supports the adoption of USO. The economic rationale behind USO is the presence of network externalities. The cost of the connection is borne by the rural customer, whereas the benefits accrue to all subscribers. Therefore, it is equitable to cross-subsidize the rural customers.[109] If there is sufficient competition present in the market then the prices would arguably be low. Thus, there would be no need for USO. However, reliance on market mechanism may be misplaced in rural areas, since the service provider will not be able to recoup the investment, it would not invest.

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[105] Boris Ramos, Khalid Saeed and Oleg Pavlov, „The impact of Universal Service Obligations and International Cross-subsidies on the dispersion of telephone services in developing countries" [2010] 44 Socio-Economic Planning Sciences 57–72.

[106] For a review of such literature see, Gary Madden, „Economic welfare and universal service" [2010] 34 Telecommunications Policy 110–116.

[107] Clarke and Wallsten (n 99).

[108] ibid.

[109] See Milton Mueller, „Universal Service: Competition, Interconnection and Monopoly in the Making of the American Telephone System" (2013). Books. Book 18 <http://surface.syr.edu/ cgi/view content.cgi?article=1017&context=books> accessed 30 December 2014.

A strong argument that favors the adoption of IT services in developing countries is that IT services, by reducing transaction costs between economic agents influence globalization.[110] Globalization is important for social and economic integration of the poor in developing countries. The easy flow of information facilitated by ICT fosters development. [111] In their recent book „Creating a Learning Society: A New Approach to Growth, Development, and Social Progress", Stiglitz and Greenwald have very well captured the importance of information in ensuring development and societal transformation.[112] It has also been seen that ICT helps achieve the Millennium Development Goals.[113]The Majority of the population, around 60 per cent, in low and middle income developing countries, still lives in rural areas.[114] The existing evidence suggests that within developing countries, the benefits from the information technology revolution have accrued mainly to urban rather than rural areas.[115] Thus, if only the rich have access to ICT it will further increase disparities. This makes a solid case for USO.

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[110] Jeffrey James, „Information technology, transaction costs and globalization" in Technology, Globalization and Poverty (Edward Elgar, 2002) 11.

[111] Phil Marker, Kerry McNamara, and Lindsay Wallace, „The significance of information and communication technologies for reducing poverty", Final Report, November 2001, DFID

[112] Joseph E. Stiglitz and Bruce C. Greenwald, „Creating a Learning Society: A New Approach to Growth, Development, and Social Progress, Columbia University Press, New York, 2014,

[113] ITU, „ICTs Will Be Critical to Attaining the United Nations" Millennium Development Goals by 2015", <http://www.itu.int/wsis/tunis/newsroom/background/ict-mdg.html> accessed 29 December 2014.

[114] Jeffrey James, „Pro-poor technical integration into the global economy" in Technology, Globalization and Poverty (Edward Elgar, 2002) 72.

[115] ibid 76.

The rationale behind providing USO is not merely limited to alleviating poverty. ICT, including internet, is helpful in checking corruption.[116] Marker et al. argue that, "lack of information, and thus lack of transparency, weaken the responsiveness and accountability of government institutions and create an environment where corruption can flourish."[117] Since the incidence of corruption is generally high in developing countries, universal access may ensure that development is not impeded because of corruption. ICT also strengthens democracy by making it participative as poor can also voice their aspirations, needs and priorities.[118] In this regard the role of e-governance plays a crucial role.[119] Thus, ICT may help developing countries in achieving various policy aims and alleviating poverty. For instance, Poverty Reduction Strategy paper for India identifies two challenges that can be solved by relying on ICT:[120]

1. Making its development more inclusive, towards an increased social cohesion and a substantial reduction of poverty, in line with the MDGs.
2. Deepening and widening structural reforms, including better governance and infrastructure, in order to

[116] See Mon-Chi Lio, Meng-Chun Liu and Yi-PeyOu, „Can the internet reduce corruption? A cross-country study based on dynamic panel data models", [2011] 28 Government Information Quarterly 47–53.

[117] Phil Marker, Kerry McNamara, and Lindsay Wallace, „The Significance of Information and Communication Technologies for Reducing Poverty", Final Report, November 2001, DFID

[118] ibid.

[119] Michiel Backus, „E-Governance and Developing Countries: Introduction and examples", Research Report, No.3. April (2003) < http://www.iicd.org/about/publications/egovernance-and-developing-countries-introduction-and-examples> accessed 30 December 2014.

[120] India: Country Strategy Paper, 2007- 2013 < http: //eeas.europa.eu/india/csp/07_13_en.pdf> accessed 28 December 2014

improve the investment climate, boost productivity and accelerate growth.

Stressing redistribution is important not only because inequality is unfair, but also because the latest economic research empirically shows that inequality hinders growth.[121] This finding will have significant policy implications. Thus, the OECD suggests that, "tackling inequality through tax and transfer policies does not harm growth, provided these policies are well designed and implemented."[122] Therefore, policies such as universal service have more to them than merely a moral argument.

Above all, it is a basic right to stay connected to fellow beings. Perhaps for this reason PekkaTarjanne, then Secretary General of the ITU, argued way back in 1998 that communication is a basic human right.[123] A United Nations report also recognizes the importance of internet to exercise right to freedom of opinion and expression, as guaranteed by article 19 of the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights.[124]

Calvo has, thus, rightly summed up that universal service leads to positive social externalities, network effects, boost in productivity, supports economic growth, reduces energy consumption and increases quality of life.[125]

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[121] F. Cingano, (2014), „Trends in Income Inequality and Its Impact on Economic Growth" (2014) OECD SEM Working Paper No. 163.

[122] ©OECD, Focus on Inequality and growth, 2014(1) <http://www.oecd.org/els/soc/Focus-Inequality-and-Growth-2014.pdf> accessed on 23.12.2104

[123] Robert Davidson, Doug Vogel, Roger Harris and Noel Jones, „Technology Leapfrogging in Developing Countries - An Inevitable Luxury?", [2000] 1 The Electronic Journal of Information Systems in Developing Countries, 1-10

[124] Frank La Rue, Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, United Nations Human Rights Council, A/HRC/17/27 Par. 47,70.

[125] Calvo (n 42).

In order to make sure that the poor in developing countries can avail themselves the benefits of ICT through universal service, and also to make sure that cross-subsidies do not distort efficiency, alternative means of providing universal service may be adopted by developing countries. For example, an increasing number of countries are shifting to Universal Service Fund (USF) ―a fund generated by taxing existing telecom services― to ensure universal service.[126] Auctioning USF may determine which firms will take USO and the compensation that they will get. Telecom service providers bid for the subsidies out of the USF. The company that bids for the lowest subsidy wins the bid. Experience has shown that, over time, countries improved the bidding structures. In certain cases, companies even made zero or negative bids, i.e., rather than seeking subsidies, they sought to pay the government in order to provide services.[127] This is also called reverse auction which is, basically, competition for subsidies. Auctions have reduced USO subsidy substantially.[128] Allman et al. suggest that competitive bidding is the best way to ensure universal service as it does not distort the market, mimics the market outcome at the least cost and thus provides sufficient incentives for efficient entry and investment.[129] In addition, USF is more transparent, and competitively and technologically neutral.[130] Following

[126] Sofie Maddens, „*Trends in Universal Access and Service Policies: Changing Policies to Accommodate Competition and Convergence'* 2005 <http://www.itu.int/ITUD/treg/Events/Seminars/GSR/GSR09/doc/USPolicy_ITUEC.pdf> accessed 15 July 2014.

[127] Wallsten (n 102).However, Wallsten cautions that "[d]etails of the auction matter. A poorly designed auction may not generate any improvement over the status quo".

[128] See, James Alleman, Paul Rappoport and Aniruddha Banerjee, „Universal service: A new definition?" [2010] 34 Telecommunications Policy 86–91.

[129] ibid.

[130] ©OECD, Rethinking Universal Service for a Next Generation Network Environment, DSTI/ICCP/TISP(2005)5/FINAL

Chile"s successes in implementing minimum subsidy auctions starting in 1995, several developing countries such as Peru, Colombia, Kenya, Uganda, and India have implemented reverse auction system to provide universal service.[131] Some countries also use the USF to supplement private investment in new networks.[132] India is one such country that uses USF to fund the roll out of fiber optic.

The other question that may perplex developing countries is what services need to be provided through universal service. In both the US[133] and the EU[134], one of the criteria to provide universal service is that a particular service is used by the majority of the population. Oestmann and Dymond suggest that no assistance should be provided for particular people until a service has achieved a reasonable take up, for example over 75 per cent of the larger population.[135] So far as internet connectivity through universal service is concerned, in the EU the current universal service requires only functional access to the internet.[136] With respect to broadband, it can be said that the majority of the population in developing countries does not have access to broadband; thus, at least for now,

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[131] Irene S. Wu, „Maximum Impact for Minimum Subsidy: Reverse Auctions for Universal Access in Chile and India" (2010) FCC Staff Working paper 2, October<https://apps.fcc.gov/edocs_public/attachmatch/DOC-302511A1.pdf> accessed on 04.02.2015

[132] A. G. Calvo, „Universal Service Policies in the Context of National Broadband Plans", (2012) OECD Digital Economy Papers, No. 203, OECD Publishing, Paris.< http://dx.doi.org/10.1787/5k94gz19flq4-en> accessed on 24.02.2015

[133] Section 254 (c) (1) of the US Telecommunications Act of 1996.

[134] European Parliament and Council, „Universal service and users' rights relating to electronic communications networks and services (Universal Service Directive)" Directive 2002/22/EC.

[135] Sonja Oestmann and Andrew Dymond, „Universal Access & Service"(Module 4 of ICT Regulation Toolkit, Mod-ule by Intelecon Research and Consultancy, Executive Summary, 2008.

[136] Art 4(2) of 2002 Universal Services Directive.

broadband should not be included as part of universal service.

In the EU, mobile telephony falls outside the mandate of USO. Since wireless is the primary mode of telephony in developing countries, it makes sense to bring it under the scope of universal service in developing countries. Calvo also argues that, in general, "mobile connectivity is eroding the justification for fixed-line subsidization through universal service obligations."[137] Since Internet is still expensive developing countries may adopt Universal Access — which refers to a publicly shared level of service, which is generally through public payphones or Internet telecentres — for the Internet.[138] In the case of mobile, only when there is an efficient market gap, a regulatory intervention is justified. This was one of the reasons for not including mobile telephony in universal services in 2006 in Europe.[139]

With respect to providing universal service, there is one reminder for competition agencies of developing countries— by providing universal service a particular carrier may gain some benefits as other carriers may indirectly and artificially strengthen its network. This was the contention of Orange against Telefónica that industry contributed universal funds, where frequencies were distributed unevenly, would be contributing to finance the expansion of the incumbent Telefónica.[140] Such issues can be solved by adjusting the contribution system, for example by taking into account the benefits a provider receives by providing universal service and balancing it against the cost incurred in providing universal service.[141]

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[137] Calvo (n 42).
[138] Oestmann and Dymond (n 135).
[139] ibid.
[140] Calvo (n 42).
[141] ibid.

The discussion above, therefore, supports the inclusion of USO as it significantly contributes to social welfare and the economic development of the poor in developing countries. It also suggests relying on USF in order to ensure redistribution without jeopardizing efficiency.

3. Conclusion

There is an inherent dilemma between providing cheap access to ICT and ensuring investment in new technology. Investment is not only important for adoption of the latest technology, but is also required for innovation. The dilemma between access and investment is all the more prominent in the context of developing countries, where a large part of the population is not in the position to pay high prices that incentivize the private players. This paper has analyzed two seemingly conflicting policy choices– access on one hand and investment on the other in the ICT sector.

Investment in the ICT sector was found imperative for the following reasons.

1. In light of the technological development in the ICT sector, new form of regulation is required that facilitates investment and innovation in this sector as the old technology and policies are no longer viable.
2. Investment in the ICT sector is directly related to growth. Not only does penetration of the new ICT services lead to development, but it also helps achieve several social welfare objectives such as poverty alleviation, improvement in health care and growth in education, corruption reduction etc.
3. ICT provides a platform for innovation in other sectors as well. Thus, faster and more efficient ICT services have the potential to create more innovation. Therefore, investment in the ICT is pertinent for overall growth.

On the other hand ensuring access to the ICT is crucial for overall inclusion and development. Above all, it is a matter

of human rights to ensure access to all the citizens. The paper looked at two specific policies, LLU and USO, which have significant effect on investment in the ICT sector. With respect to LLU, the paper has argued that in light of the adverse effects of LLU on investment, the need to upgrade to NGNs because of the advent of new technology, the failure of ladder of investment technique, it is important that developing countries jettison LLU. Especially, as mobile telephony has already started substituting fixed telephony in the local loop, LLU should no longer be a policy choice for developing countries. The traditional model of USO which relies upon cross-subsidization is no longer viable in view of a competitive telecom market. Thus, USO may be detrimental for investment and innovation. However, being mindful of the urban-rural divide and positive effects of ICT in poverty alleviation and quality of life, it is argued that market based solution to provide universal services such as Universal Services Fund should be preferred. Further, in light of the shift from wireline to wireless in developing countries, universal services should be provided for wireless in developing countries. However, regulatory intervention should come only when the market cannot provide access efficiently. Therefore, there are regulatory choices available that ensure proper incentives for the innovation and adoption of latest ICT, which at the same time ensure easy access to the poor. Before any policy recommendation could be made, it was important to see if wireless and wireline are substitutes in the local loop in developing countries. Even though there are qualitative limitations of mobile telephony, increasing numbers of developing countries have started substituting wireline with wireless technology, as it is significantly cheaper than rolling out new fiber. A disruptive innovation analysis also suggests that wireless in the local loop is replacing fixed telephony.

The policy prescriptions of this paper, however, must be seen with one caveat —the analysis presented in this paper is specific to the ICT sector. Thus, it takes into account the different dynamics and peculiar characteristics of this sector. Additionally, each developing country is different, and thus the prescriptions serve only as a starting point.

CHAPTER 4

Pharmaceutical Mergers and Their Effect on Access and Efficiency: A Case of Emerging Markets

(2016) 39(3) *World Competition* 465-92

Pharmaceutical M&As in emerging markets may jeopardize cheap access to generics. This may be a motivation for policy makers to use competition law as a tool to deter cross-border M&As. Additionally, while M&As in the pharmaceutical sector may give rise to certain efficiencies, it is not clear how efficiencies will be treated in the peculiar socio-economic context of emerging markets. This article develops a theoretical framework that argues that the application of competition law is guided by sector-specific socio-economic realities and institutional realities of the jurisdiction. Thereafter, it employs this framework to analyze the issues of access to generics and efficiencies of production.

Introduction

The pharmaceutical sector witnessed a spate of Merger and Acquisition (M&A) activity in the recent past. This trend extends to emerging markets, in which the M&A wave included branded companies acquiring generic firms.[1] In

[1] For an account of cross-border acquisitions in the Indian pharmaceutical sector, see Centre for Trade and Development (Centad), *Competition Law and Indian Pharmaceutical Industry*, New Delhi, 2010, pp. 47 et seq, http://www.cci.gov.in/sites/default/files/PharmInd230611_0.pdf (accessed 7 Mar. 2016). Emerging market firms also acquired foreign firms. Based on a survey of existing

general, M&A may be triggered by various motivations.[2] Danzona et al. observe that pharmaceutical ―mergers are frequently the response to expected excess capacity that is triggered by patent expirations and gaps in the product pipeline which render marketing resources unproductive."[3] Chataway et al. also note that contemporary R&D-based multinational firms are changing their corporate and organizational system as a result of increasing sectoral maturity, and that these changes have led to M&As and creating links with Indian firms.[4] So far as the desire to achieve efficiencies is concerned, Ravenscraft and Long in their research find that pharmaceutical mergers lead to

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literature, Duppati and Rao note that emerging market firms participate in cross-border acquisitions for two important reasons: resource advantage (e.g., financial, technological, managerial and ownership) and fast entry into global market (e.g., geographical diversification and international competitive share). Geeta Rani Duppati & Narendar V. Rao, *Cross-border Mergers and Acquisitions: Mature Markets vs. Emerging Markets—With special reference to the USA and India*, 2 Cogent Business & Management 1 (2015).

2 For an account of different efficiencies and anticompetitive effects that can result from mergers, see Lars-Hendrik Röller, Johan Stennek & Frank Verboven, *Efficiency Gains from Mergers*, No 543, Working Paper Series from Research Institute of Industrial Economics (2000).

3 Patricia M. Danzona, Andrew Epstein & Sean Nicholson, *Mergers and Acquisitions in the Pharmaceutical and Biotech Industries*, 28, Manage. Decis. Econ. 325, 307–328 (2007).

4 Joanna Chataway, Joyce Tait & David Wield, *Frameworks for Pharmaceutical Innovation in Developing Countries—The Case of Indian Pharma*, 19(5) Technology Analysis & Strategic Management 697–708 (2007); See also, Samira Guennif & Shyama V. Ramani, *Explaining Divergence in Catching-up in Pharma between India and Brazil using the NSI Framework*, 41 Research Policy 430–441 (2012). The authors note ―Indian firms have such high production capabilities and can manufacture generics at such low prices that they are becoming attractive to global players."

economies of scale and scope. However, their main finding is that pharmaceutical mergers are entered into with the objective to eliminate excess capacity and inefficiencies induced by the changing industry structure and firm product portfolios.[5]

The relationship between pharmaceutical mergers and R&D has not found much attention in the empirical economics.[6] Ornaghi in his analysis, conducted using pharmaceutical industry data for the period 1988–2004, found that mergers adversely affect R&D in the pharmaceutical sector.[7] Ravenscraft and Long agree that R&D expenditures are cut post-merger in the pharmaceutical industry. They explain that, these "Cutbacks are a result of changing pharmaceutical economics making marginal internal projects less attractive and some external alliance projects more promising."[8] The effect of reduced R&D expenditures on innovation is unclear, however.[9] There are contrary claims too that acknowledge the positive effects of mergers on R&D. Cassiman et al show that, in general, M&A between partners with *ex-ante* complementary technologies result in more active post-merger R&D

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5 David J. Ravenscraft& William F. Long, *Paths to Creating Value in Pharmaceutical Mergers*, in Mergers and Productivity, from National Bureau of Economic Research, Inc. 287–326 (2000).

6 For a review of the studies on the effect of M&A on R&D, see Elena Cefis, Mark Grondsma, Anna Sabidussi & Hans Schenk, *The Role of Innovation in Merger Policy: Europe's Efficiency Defence versus America's Innovation Markets Approach*, 7(21) Discussion Paper Series/Tjalling C. Koopmans Research Institute (Discussion paper) (2007).

7 Carmine Ornaghi, *Mergers and Innovation in Big Pharma*, 27 International Journal of Industrial Organization 70–79 (2009).

8 Ravenscraft& Long, *supra* n. 5, p. 322.

9 Eleanor J. Morgan, *Innovation and Merger Decisions in the Pharmaceutical Industry*, 19(2) Review of Industrial Organization 181–197(2001).

performance.[10] Consequently, to the extent pharmaceutical mergers are motivated by the desire to achieve efficiency and innovation, the role of law should be to foster such activity.

There may be other reasons too for multinational firms to acquire local pharmaceutical companies in emerging markets. The acquisition of generics by branded firms could be the result of a strategy to stop the generics from competing with the branded medicines. Such fear has been expressed in a report of the Indian Parliamentary Standing Committee.[11] The report expresses its fear over the acquisition of the local generics firms by observing: ―[w]hen the Government would consider imposing compulsory license, there are likely to be no takers, because there will be only a few or no Indian generic companies left."[12] The report goes on to note that such concentration will lead to an oligopolistic market, where it will be easier to increase the prices.[13]Concerns have also been raised about the changing post-acquisition business strategy of the generics firms. For instance, in India, Daiichi-Sankyo (acquirer) immediately after acquisition of Ranbaxy, withdrew all its patent challenges on Pfizer's blockbuster medicine Lipitor, filed in more than eight countries.[14] These concerns may lead emerging markets to use competition law as a tool to block the acquisition of their generic firms.

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[10] Bruno Cassiman, Massimo G. Colombo, Paola Garrone & Reinhilde Veugelers, *The Impact of M&A on the R&D Process An Empirical Analysis of the Role of Technological- and Market-Relatedness*, 34 Research Policy 195–220 (2005).

[11] One hundred and tenth report on FDI in pharmaceutical sector, Rajya Sabha Secretariat, New Delhi August, 2013, p. 9, http://164.100.47.5/newcommittee/reports/English Committees/Committee%20on%20 Commerce/110.pdf (accessed 7 Mar. 2016).

[12] *Ibid.*, pp. 10–11.

[13] *Ibid.*, p. 11.

[14] *Ibid*., p. 19.

The article enquires into the abovementioned two issues, brought to the fore as a result of pharmaceutical mergers in emerging markets. The first issue is regarding the acquisition of local generics by branded Multinational Corporations (MNCs), and the resulting fear of unavailability of generic medicines. This issue is addressed in Part B. This part argues against using competition law as an industrial policy tool, and employs established competition law tools in order to ensure access to generics. Part C of the article addresses the treatment of efficiency claims in pharmaceutical mergers in emerging markets. First, however, it is important to develop a theoretical framework to understand the nature of competition law in emerging markets and guide the analysis of both the issues. This framework is developed in Part A.

The article, therefore, makes a twofold contribution. First, it argues against employing competition law as an industrial policy tool; instead, it suggests ways to rely upon mainstream competition law tools to address consumer harm. Second, by developing a theoretical framework for appreciating efficiencies resulting from mergers in emerging markets, the article advocates a more positive recognition of efficiency claims in emerging markets. This article does not look into the viability of cross-border pharmaceutical M&As by MNCs in developing countries.[15] Whether to allow foreign direct investment through M&As is an issue for sector-specific policy.

The term –emerging markets" is hugely debated. Different institutions have different criteria to classify a country as an

[15] For a background on this issue, see SanjayaLall, *Implications of Cross-Border Mergers and Acquisitions by TNCs in Developing Countries: A Beginner's Guide*, QEH Working Papers, 88, http://www3.qeh.ox.ac.uk / RePEc/qeh/qehwps/qehwps88.pdf (accessed 7 Mar. 2016).

emerging market.[16] This article, at the cost of generalization, uses the terms ‗emerging markets,' ‗developing countries' and ‗transition economies' interchangeably, partly for the reason that the existing antitrust literature has not made any such differentiation. Some of the common characteristics of emerging markets are lack of competition culture; concentration of economic and political power, which facilitates the capture of public entities; scarcity of financial and human resources; abundance of small and medium-sized firms; and lack of capacity in the judicial system.[17]

1. Theoretical framework

Is there a need for a different kind of competition law, including enforcement priorities for emerging markets? Various scholars have answered this question in the affirmative.[18] Pérez Motta identifies two characteristics of

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[16] See, Peter Marber, *Redefining EM: Country Clusters offer New Matrix*, Financial Times (5 Aug. 2015); see also Robert E. Hoskisson, Lorraine Eden, Chung Ming Lau & Mike Wright, *Strategy in Emerging Economies*, 43(3) The Academy of Management Journal, 249–267(June 2000).

[17] See, Eugenio Rivera and Claudia Schatan, *Markets in Central America and Mexico: What Is Happening with Competition?,* Claudia Schatan& Eugenio Rivera (eds.), Competition Policies in Emerging Economies: Lessons and Challenges from Central America and Mexico, 16, 7–47 (Springer 2008).

[18] See among others, Josef Drexl, *Consumer Welfare and Consumer Harm: Adjusting Competition Law and Policies to the Needs of Developing Jurisdictions*, Michal S. Gal et al. (eds.) The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law, 293, 265–295 (Edward Elgar 2015), ‗Drexl advocates changes in ‗consumer welfare test' to accommodate socio-political, economic and cultural differences in developing countries. He argues that in certain cases ‗protecting the competitive process without the need to show that the relevant practices also produce harm to consumers would enhance the effectiveness of competition law in the

emerging markets. First, small market size (as the number of players, regardless of the population, who can participate in the market is small) resulting in only a few firms that could achieve Minimum Efficient Scale (MES). Second, scarcity of capital (as capital markets do not function in a competitive way) resulting in high cost of capital and thus only a few companies in the marketplace.[19] Gal also gives a very general understanding of small economies. She states, a "[s]mall economy is an independent sovereign economy that can support only a small number of competitors in most of its industries."[20]

There are at least two reasons for which one can disagree with these assertions, however. First, developing countries are very different from each other. Second, all the sectors of the economy may differ from each other.[21] For example, the pharmaceutical industry in India is quite robust and, according to a few scholars, is already showing the signs of progressing

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economic interest of the individual developing country." ; Eleanor Fox, *Competition, Development and Regional Integration: In Search of a Competition Law Fit for Developing Countries*,in*Competition Policy and Regional Integration in Developing Countries*, 273–290 (Josef Drexl et al (eds.), Edward Elgar 2012); William E. Kovacic, *Institutional Foundations for Economic Legal Reform Transition Economies: The Case of Competition Policy and Antitrust Enforcement*, 77 Chi.-Kent L. Rev. 265 (2001).

19 Pérez Motta, *Competition Policy, Abuse of Dominance and Economic Development in Developing Countries*, Barry E. Hawk (ed.), Chapter 16, International Antitrust Law & Policy (Fordham Comp. L. Inst., 2010), p. 360.

20 Michal S. Gal, *Competition Policy for Small Market Economies*, 1 (Harvard University Press 2003).

21 Some critiques believe that Gal's conception of small economies is too skewed and does not represent the correct picture. See, Rivera & Schatan, *supra* n. 17, p. 12.

―from imitation to innovation."[22] The Organisation for Economic Co-operation and Development (OECD) argues that in very large countries such as China or India, certain areas of the economy can be very advanced despite the average backwardness of the economy.[23] The Global Innovation Index (2014) report notes that ―[m]ost of the BRICS [Brazil, Russia, India, China and South Africa] economies are also showing other signs of progress. All of them, with the exception of South Africa, qualify as ‗efficient innovators' this year [2014]."[24] The management literature has studied a different kind of phenomenon known as reverse innovation, where innovations take place in emerging markets and then ―trickle up" to developed countries.[25] Furthermore, consumers in

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[22] Joanna Chataway et al., *supra* n. 4, p. 698, The authors argue ―The imitation approaches of Indian pharmaceutical firms are becoming increasingly sophisticated—not just focused on production cost strategies, but also on sophisticated incremental process and product innovation."

[23] ©OECD, *Innovation for Development* (2012), http:// www. oecd. org / innovation/inno/50586251.pdf (accessed 7 Mar. 2016).

[24] Cornell University, INSEAD, and WIPO, *The Global Innovation Index 2014*: *The Human Factor In innovation, second printing*, Fontainebleau, Ithaca, and Geneva, p. 12, (2014) < http: // www. wipo. int/edocs/ pubdocs/en/economics/gii/gii_2014.pdf> (accessed 7 Mar. 2016).

[25] See, Vijay Govindarajan& Ravi Ramamurti, *Reverse Innovation, Emerging Markets, and Global Strategy*, 1 Global Strat. J.,191–205 (2011); See also, Marco Zeschky, Bastian Widenmayer& Oliver Gassmann, *Frugal Innovation in Emerging Markets*, 54(4) Research-Technology Management, 38–45 (July–August 2011). Zeschky et al., use the term ―frugal innovation" for the low-cost innovation that originates in developing countries and finds its way to the developed countries; For an account of different forms of innovation arising in developing countries and how they are different from ―reverse innovation," see Max von Zedtwitz, Simone Corsi, PederVengSøberg& Romeo Frega, *A Typology of Reverse Innovation*, 32(1) Journal of Product Innovation Management, 12–28(January 2015).

different sectors are very distinct from each other. For instance, a pharmaceutical merger may have wider implications across the diverse group of consumers in emerging markets, as compared to a merger between makers of luxury watches which only a few can afford. Therefore, the general characteristics of a jurisdiction do not make a case for separate substantive standards in competition law.

In the case of specific sectors as well, the fundamental tools of competition law, such as relevant market, market power, theories of harm, etc. are inherently capable of identifying consumer harm in varied economic settings, regardless of the jurisdiction. Theories of consumer harm take into account sector-specific economic realities (such as size and number of competitors, entry barriers, whether the competition is Bertrand or Cournot, whether the products are differentiated or homogenous, and diversion ratios) in any particular jurisdiction. For instance, as a few scholars have argued, emerging markets have high concentration and huge entry barriers.[26] The following illustration shows how competition law is capable of taking into account such market characteristic while assessing consumer harm.

Ruritania is an emerging market with high concentration and huge entry barriers. There are three market players A, B and C with market shares 30, 30 and 40 respectively in a particular industry. The products offered are homogenous in nature. Further, the entry barriers in this sector are high, owing to huge sunk costs and difficulties in raising capital. The

[26] See M.S. Gal & E.M. Fox, *Drafting Competition Law for Developing Jurisdictions: Learning from Experience*, in *The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law*, 296–356 (Michal S. Gal et al (eds.), Edward Elgar 2015).

competition agency is to assess a merger between A and C. These specific features of Ruritanian market will factor into defining market power, concentration and theories of harm. The assessment would be the same regardless of the jurisdiction. It is noteworthy that while the nature of entry barriers may be different in emerging markets, this will have no bearing on substantive analysis. Also, merger scrutiny triggers such as "safe harbor" thresholds and HHI indices are jurisdiction-specific and are based on economic realities.

Interestingly, the choice of economic model to test the theories of harm may depend upon a particular jurisdiction. The ICN observes: "[t]he type and sophistication of analysis that can be performed depends on the data available, the features of the market, the economic issues under consideration, and any timing and/or resource constraints that the agency might be under."[27] Arguably, in emerging markets, relevant data may not be readily available and the competition authorities tend to suffer from resource constraints. This means the competition authorities in emerging markets should prefer those economic methodologies that do not rely heavily on data. Thus, the application of competition law is largely sector-specific, although there are certain issues that are indeed jurisdiction specific, for example enforcement priorities.[28]

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[27] ICN, *The Role of Economists and Economic Evidence in Merger Analysis*, prepared by The Merger Working Group Presented at the 12th Annual Conference of the ICN Warsaw, Poland, p. 3 (2013).

[28] Maher Dabbah argues that action against abuse of dominance should be a priority in developing countries. See, Maher Dabbah, *Competition Policy, Abuse of Dominance and Economic Development in Developing Countries*, Barry E. Hawk (ed.), Ch. 16, International Antitrust Law & Policy (Fordham Comp. L. Inst., 2010), p. 365; see also Simon J. Evenett, *Competition Law and the Economic Characteristics of Developing Countries*, Michal S. Gal et al. (eds.) The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law, 24, 15–30 (Edward Elgar 2015).

So far as the competition assessment of mergers is concerned, there are several issues that are independent of jurisdiction. Both developed and developing countries have to deal with these issues in the same fashion. These issues include market definition, entry barriers, theories of harm, countervailing buyer power and the failing firm defense. With regard to efficiencies, common issues are the verifiability requirement, the acceptability of fixed cost savings, merger specificity and the pass-on requirement. Regardless of the jurisdiction, the existing framework within which the efficiencies are taken into account is already very skeptical of efficiency claims. For these reasons, there is no need to change the substantive competition law tools. However, that does not imply that emerging markets should have exactly the same kind of competition law framework as developed countries. The following text looks at the social and institutional realities in emerging markets, and argues for customizing the enforcement accordingly.

Gifford and Kudrle note that ―[m]erger policy may rest on both sociopolitical and economic grounds, and some important decisions on both sides of Atlantic have stemmed from each."[29] In the accompanying footnote to this assertion, the authors mention some mergers on both sides where industrial policy played a definitive role. In the context of emerging markets, however, economic factors are not independent of social factors. Rather, the latter at times, influence the choice of the former in competition assessment, even if they are not triggered by industrial policy concerns. For example, the choice of the consumer welfare standard over a total welfare

[29] Daniel J. Gifford & Robert T. Kudrle, *The Atlantic Divide in the Antitrust: The Examination of US and EU Competition Policy*, 40 (The University of Chicago Press 2015).

standard in emerging markets is guided by jurisdiction-specific socio-economic realities, as the majority of population is less well off.[30] However, not all social realities can be addressed within the framework of competition law. For example, historically disadvantaged sections of the population do require affirmative actions, but such actions are best served through other tools such as reservations and subsidies.[31] Only those social realities that have bearing on consumer welfare and efficiency should be accounted for under competition law.

In a 1997 article, Kovacic set out the distinctive traits of emerging markets (Kovacic uses the term "transition environment") that have bearing on the enforcement of competition law in general and merger enforcement in particular.[32] Some of the distinctive traits are fragile political foundations for competition law, weak indigenous competition policy expertise, dysfunctional courts, frail transparency safeguards, resource shortages and data shortcomings. In view of the duration of time that has lapsed since this observation was made and the rising significance of competition law, it is not appropriate now to make such general observations. However, one claim holds good: Antitrust institutions are at

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[30] See the text accompanying footnotes 93–103.

[31] Example of historically disadvantaged sections could be backward classes in India and non-whites in South Africa. South African competition law has special provisions for non-whites. There are several countries that have special provisions for public interest cases, for instance South Africa (s. 16 of the Competition Act, 1998) Zimbabwe [Section 32 of Competition Act (Chapter 14:28)], Namibia (s. 47 of the Competition Act, 2003). However, such non-efficiency objectives are best served through other legislations.

[32] William E. Kovacic, *Merger Enforcement in Transition: Antitrust Controls on Acquisitions in Emerging Economies*, 66 U. CIN. L. REV. 1075, 1090 (1997–98).

the core of successful enforcement of competition law.[33] The importance of antitrust institutions is reflected in this statement that Kovacic and Eversley made in a later article:

The design of a jurisdiction's administrative infrastructure can have a decisive influence on the type and quality of policy outcomes that a competition system achieves. Both older and newer competition systems have come to realize that a body of competition laws is only as good as the institutions entrusted with their implementation.[34]

Studies highlight the basic characteristics of an effective competition agency, such as autonomy from the executive branch of government, stable funding, competition specialist commissioners, and objective processes for choosing and removing commissioners.[35] Therefore, so far as the enforcement of competition law in emerging markets is concerned, it is appropriate to analyze the institutions and make suitable changes, rather than to tweak the substantive law.[36] The focus of enquiry, thus, should shift from substantive law to institutions in emerging markets.

The framework developed here argues against tweaking the substantive competition law in the context of emerging markets and reducing it to an industrial policy tool. The

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[33] For the importance of institutions in furthering policy and growth, see Douglass C. North, *Institutions, Institutional Change and Economic Performance* (Cambridge University Press 1990); see also, D. Daniel Sokol, *Antitrust, Institutions, and Merger Control*, 17 Geo. Mason L. Rev. 1055 (2009–2010).

[34] W.E. Kovacic& D. Eversley, *An Assessment of Institutional Machinery: Methods Used in Competition Agencies and What Worked for Them,* 1 (International Competition Network 2007).

[35] See Rivera & Schatan, *supra* n. 17, p. 28.

[36] For the institutional characteristics of emerging markets and their possible implication for enforcement, see Gal & Fox (n 26).

objectives of industrial policy and competition law may often be in conflict with each other. However, subjugating competition principles in order to achieve industrial policy objectives is not the optimal solution, as there exist other policy tools to achieve the same objectives with minimum distortions in the market.[37] The framework here argues that application of competition law is sector-specific, and the inherent tools of competition law are flexible enough to be mindful of socio-economic realities of a particular sector in emerging markets. Relying on the underlying economic and technological realities of a sector in competition assessment is more scientific and less controversial. Additionally, the application of competition law is guided by the institutional realities of a jurisdiction. The article therefore argues for contextualizing competition law based upon the socio-economic characteristics of a sector and the institutional realities of a specific jurisdiction. The sector of enquiry chosen in this article is pharmaceuticals market in emerging markets. A general caveat applies—these prescriptions merely serve as a starting point.

2. Issue of access

The acquisition of generic pharmaceutical firms in emerging markets presents several challenges. With respect to the acquisition of a generic by a branded firm, there may arise two issues that have bearing on welfare. First, there will be a loss of competition if a branded originator acquires an important or sole manufacturer of its generic equivalent. Second, as has been alleged in India, there may be a case that after the

[37] See, Simon J. Evenett, *The Return of Industrial Policy: A Threat to Competition Law?*, Vinod Dhall (ed), Competition Law Today: Concepts, Issues and the Law in Practice, 452–478 (Oxford University Press 2007).

acquisition, the acquired entity stops manufacturing generics. In addition, some governments might desire to protect their national champion from being acquired. What possible remedies do developing countries have?

One way to deal with such M&As could be to use competition law as a tool to protect ―national champions" in the pharmaceutical sector. This industrial policy desire may have implications for competition law in two ways. First, competition law may be used to prohibit acquisition of a local firm by an international firm.[38] Second, an otherwise anticompetitive merger may be cleared by a competition agency in order to create a national champion.[39] In China, the

[38] A reverse phenomenon can be seen in 2006 E.ON/Endesa case in the EU, where the European Commission approved the acquisition of Spanish electricity provider by a German energy group, Commission decision of 25 Apr. 2006, Case COMP/M.4110 – *E.ON / ENDESA*. However, the Spanish energy regulator tried to impede the acquisition. See, Damien Geradin&IanisGirgenson, *Industrial Policy and European Merger Control– A Reassessment*, Barry E. Hawk (ed.) International Antitrust & Policy (Fordham Comp. L. Inst., 2011), p. 364.

[39] Resisting pressure from several Member States, the European Commission blocked the acquisition of de Havilland by Aerospatiale and Alenia purely on competition grounds. If permitted, this acquisition would have created a national champion in the global market for regional turboprop aircraft. See, Geradin&Girgenson, *supra* n. 38, p. 365. Geradin and Girgenson have very well captured the conflict of industrial policy concerns and EU merger control system. However, in none of the case discussed by the authors, competition analysis was tweaked in order to accommodate industrial policy objectives. The authors, however, discuss a possibility of furthering industrial policy through competition law. They argue that the Commission in the *Volvo/Scania merger* case could have taken the European market as the relevant market instead of holding that national markets were national in scope, thus parties would have held dominant position after the merger (p. 375).

competition law has often been used to further industrial policy goals including protecting and promoting national champions.[40] The European Commission takes a very interesting position on forming a national champion. The European Commission is not against national champions per se, as long as their status is achieved in accordance with EC law on competition, mergers and State aid.[41]

The OECD argues that relying upon industrial policy to protect a national champion may be counterproductive.[42] This article agrees that governments should not compromise competition rules in merger assessment to create or protect a national champion. There are other policy tools to ensure that foreign firms do not acquire local ones—for example, sector-specific

[40] Glencore/Xstrata (MOFCOM required Glencore to divest the Las Bambas mine in Peru, in order to extend the scope of a Chinese company in Latin America), Marubeni/Gavilon (the parties were required to keep their soybean exporting and selling operations completely separate in order to promote state-owned commodities company), Coca-Cola/Huiyan (the acquisition was blocked, apparently to maintain Chinese ownership of a famous brand), see the report of US Chamber of Commerce, ―Competing Interests in China's Competition Law Enforcement: China's Ant-Monopoly Law Application and the Role of Industrial Policy." See MOFCOM, Notice 22/2009 of MOFCOM on Coca-Cola Company Merger with Huiyuan Juice Group Ltd. (2009). For the official Chinese text, see http://fldj.mofcom.gov.cn/aarticle/ztxx/200903/20090306108494.html (accessed 7 Mar. 2016).

[41] See, Contribution by the European Commission, © OECD, Competition Policy, Industrial Policy and National Champions, DAF / COMP/GF (2009) 9.

[42] © OECD, *Competition Policy, Industrial Policy and National Champions*, DAF / COMP /GF(2009), 9.

regulation.[43] However, such policy tools have to be applied within the World Trade Organization (WTO) framework.

2.1. Potential competition in mergers and access to generics

This part of the article draws from the theoretical framework developed in Part A, and argues against tweaking competition law provisions to promote industrial policy goals. Where an originator acquires a generic that is active in the same market, it can lead to loss in actual competition. A new/innovative drug passes through various stages before it is marketed.[44] A huge investment is required in order to come up with a new drug. As opposed to an originator drug, a generic drug—which is the therapeutic equivalent of a branded drug—does not have to invest the same amount and is chemically identical to the branded drug. Generics typically are around 20%–50% cheaper than their branded counterparts.[45]

Acquisition of a generic company by a branded firm can be dealt with relying on the theories of harm in case of horizontal mergers, as both branded and corresponding generic are in the same relevant market. Thus, the acquisition of the generic may remove an important competitive constraint leading to consumer harm.[46] There may be cases when the acquired

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[43] Footnote100, Geradin and Girgenson, *supra* n. 38. The authors give example of a couple of cases where, Member States employed sector regulations to prohibit the acquisition.

[44] For an account of various clinical and regulatory stages involved, see The FDA's Drug Review Process, *Ensuring Drugs Are Safe and Effective,* http://www.fda.gov/drugs/resourcesforyou/consumers/ucm143534.htm, (accessed 7 Mar. 2016).

[45] Case COMP/A. 37.507/F3. AstraZeneca.

[46] See Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 24.

generic firm is not currently competing with the branded but has substitutable generic drug in its pipeline. Relying upon the concept of potential competition, the discussion here shows that for emerging markets it is possible to address welfare loss arising because of acquisition of generic drugs that are in pipeline by foreign originator firm.

The Court of First Instance (now the General Court) in the European Night Services held that:

It must also be stressed that the examination of conditions of competition is based not only on existing competition between undertakings already present on the relevant market but also on potential competition, in order to ascertain whether, in the light of the structure of the market and the economic and legal context within which it functions, there are real concrete possibilities for the undertakings concerned to compete among themselves or for a new competitor to penetrate the relevant market and compete with the undertakings already established.[47]

Thus, potential competition is crucial to protect consumer welfare. This concept is of significant relevance in the pharmaceutical market sector. In the *Sanofi-Aventis/Zentiva*[48] case, the European Commission applied this concept successfully. Sanofi-Aventis was primarily an innovator firm, whereas Zentiva N.V. was active in the development, manufacturing and marketing of branded generic pharmaceutical products. The Commission investigated the effect of Zentiva‘s acquisition on the products in which Sanofi-Aventis had an important position in an originator

[47] Joined cases T-374/94, T-375/94, T-384/94 and T-388/94, *European Night Services v. Commission*, ECR II-3141 (1998), para. 137.

[48] Case No. COMP/M.5253 – *SANOFI-AVENTIS / ZENTIVA.*

molecule, and Zentiva had an existing generic equivalent of another molecule with the same therapeutic indications, or a generic equivalent of the original molecule of Sanofi-Aventis in its pipeline.[49] Thus, the Commission had to analyze future competition harm in this case.[50] The Commission also considered whether the change of control over Zentiva would lead to less generic competition in the future, both for molecules whose patents were held by Sanofi-Aventis itself, and for originator molecules marketed by other pharmaceutical companies, i.e., generic competition in general.[51]

There was also a possibility that the acquirer (Sanofi-Aventis) would use the target (Zentiva) to introduce its own generic version of the molecule (authorized generic). With respect to the last concern (authorized generic), the European Commission was of the view that the impugned strategy was not merger-specific, and also that it would be a successful strategy only if the regulation provided an incentive for the first generic entrant.[52] If there are several generic manufacturers present in the market, then such a strategy by the acquirer is less likely to affect the consumer welfare. So far as the products where Zentiva already had a generic version of the Sanofi-Aventis drug in its pipeline, and the fear was that the acquirer would either cancel or launch them as an authorized generic, the European Commission allayed such fears as there were large numbers of alternative well-established competitors planning to launch the same

[49] The innovator drug and its generic copies are based on the same active compound.

[50] *SANOFI-AVENTIS / ZENTIVA*, *supra* n. 48, para. 194.

[51] *Ibid.*,para. 195.

[52] *Ibid.*,para. 507.

molecule.[53] The European Commission's market investigation and econometric analysis also demonstrated that Zentiva did not exercise a unique competitive constraint on Sanofi-Aventis. Thus, it is a matter of enquiry to assess the strength of competition in each relevant market. If there are serious concerns over increased market power, remedies such as divestiture may be adopted. Therefore, relying on the concept of potential competition, competition agencies in developing countries can ensure that the acquisition of a generics firm does not lead to consumer harm arising from a reduction in competition.

The Hoechst/Marion Merrell Dow[54] merger and the Baxter/Wayeth Corporation [55] acquisition in the US also witnessed the application of potential competition theory. In the former case, Hoechst was required to divest one of the two drugs in each market. In the latter, the Federal Trade Commission (FTC) charged that the acquisition would reduce competition in the manufacture and sale of propofol (a general anesthetic). The consent order required divestiture in each of the pharmaceutical markets. In both of these transactions, as well as in the Zeneca/Astra merger, potential competition theory was employed to protect competition and consumer welfare.[56]

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53 *Ibid.*,para. 509.

54 Hoechst AG, C-3629, 120 FT.C. at 1010.

55 Baxter Int'l, Inc. & Wyeth, FTC Docket No. C-4068 (3 Feb. 2003), https://www.ftc.gov/enforcement/cases-proceedings/0210171/baxter-international-inc-wyeth-matter (accessed 7 Mar. 2016).

56 Zeneca Group PLC, C-3880 (7 Jun. 1999) (consent order). For a general discussion on the use of potential competition theory in mergers, see David A. Balto& James F. Mongoven, *Antitrust Enforcement in Pharmaceutical Industry Mergers*, 54 Food & Drug L.J. 255 (1999).

So far as M&A transactions between generics firms are concerned, a competitive assessment based on market share is generally used to analyze horizontally affected markets and assess possible effects on consumer welfare. The *Teva/Barr* case in the EU is one such case where two primarily generic firms decided to merge.[57] The competitive analysis in an emerging market will be no different from the one used in EU. However, market realities are different in emerging markets and the entry barriers may be higher. Thus, such a merger may pose problems even if the joint market share post-merger is not very high. In the *Sanofi-Aventis/Zentiva* merger, the European Commission observed that the main entry barriers in the generic market are investment required to establish generic bioequivalence, obtaining a marketing authorization, building up an operation, registering for reimbursement, securing reimbursement approval, promoting and organizing the distribution of a generic drug, and gaining local knowledge.[58] Based on this observation, the European Commission was of the view that to enter a national market with a generic drug takes at least one to two years and may take significantly longer in many cases.[59] The Commission thus was of the view that there were significant entry barriers in the generic market. In case of developing countries, there may be additional barriers, such as higher cost of capital and technological barriers.

Drexl argues, ―protection of the local competitors against incoming international players should not be excluded from the ambit of domestic competition law (of developing

[57] Case No COMP/M.5295 -*TEVA / BARR.*
[58] *SANOFI-AVENTIS / ZENTIVA*, *supra* n. 48, para. 213.
[59] *Ibid*.,para. 213.

countries)."[60] This proposition is problematic, as any such attempt would reduce the competition legislation to an industrial policy tool. Drexl adds that "[i]n the Carribbean situation, competition law could also be used to protect small local tourism service providers against exclusionary practices and restrictive vertical agreements of larger tourism businesses from developed countries."[61] Even though the end aim is to promote the interest of the economy of emerging markets, this is not the role of competition law. Going by this rationale, a competition agency would have to discriminate between local and multinational pharmaceutical companies in emerging markets.

3. Efficiency defense in pharmaceutical mergers: an emerging market perspective

There is a rich literature from legal, economics and management backgrounds that justifies the inclusion of efficiencies in merger analysis.[62] A pharmaceutical merger can give rise to both horizontal and vertical concerns. If both the merging parties are active in the same formulation market, the merger can give rise to horizontal concerns. Whereas, if the parties are present in Active Pharmaceutical Ingredient (API) and formulation markets respectively, the merger may give rise to vertical concerns, such as input foreclosure or customer foreclosure. Efficiencies can be pleaded as defense in both types of cases.

The issue of innovation in mergers may arise in two cases. First, innovation itself may be at stake because of a proposed

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60 Josef Drexl, *supra* n. 18.

61 *Ibid.*

62 For example, see Reinhilde Veugelers, *Innovation in EU Merger Control: Walking the Talk*, Bruegel Policy Contribution, No. 2012/04.

merger. For example, an originator drug company may seek to acquire another originator drug company that is actively pursuing the same drug. To assess the effect of such acquisitions on innovation, Gilbert and Sunshine in their influential article had proposed the adoption of an innovation market approach.[63] Innovation markets were defined as "the research and development directed to particular new or improved goods or processes, and the close substitutes for that research and development."[64] After delineating such a market for R&D aimed towards the development of a new product, merger law is applied just like conventional cases. As Gilbert pointed out, until the mid-1990s, the DOJ and FTC rarely relied upon innovation considerations to challenge mergers.[65] The number of such challenges kept increasing until early 2000. However, such challenges declined later.[66] The relationship between market structure and innovation is not conclusive.[67] Thus, reduction in R&D competition as a result

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[63] Richard J. Gilbert & Steven C. Sunshine, *Incorporating Dynamic Efficiency Concerns in Merger Analysis: the Use of Innovation Markets*, 63Antitrust Law Journal, 569–602 (1995).

[64] Dep't of Justice and Federal Trade Comm'n, Antitrust Guidelines for the Licensing of Intellectual Property ("IP Guidelines") (6 Apr. 1995), §3.2.3.

[65] Richard J. Gilbert, "*Competition and Innovation*," Wayne Dale Collins (ed.), Issues in Competition Law and Policy, American Bar Association Antitrust Section (2006) http://works.bepress.com/richard_gilbert/12/ (accessed 16 Mar. 2016).

[66] Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc.<https://www.ftc.gov/system/files/attachments/press-releases/ftc-closes-its-investigation-genzyme-corporations-2001-acquisition-novazyme-pharmaceuticals-inc./murisgenzymestmt.pdf> (accessed 7 Mar. 2016).

[67] For a good review of literature on this issue, see Michael L. Katz & Howard A. Shelanski, *Mergers and Innovation*, 74 Antitrust L.J. 1 (2007).

of a merger may not necessarily have a detrimental effect on innovation. For this reason, some commentators find the ―innovation market" concept ―inherently speculative."[68] Interestingly, in the US a point of departure from the conventional ―innovation markets" concept can be seen in the *Novazyme/Genzyme* merger—a merger to monopoly scenario—that was approved by the FTC for its potentially beneficial effects on innovation. In this case, a majority of the Commissioners did not follow the presumptions applicable in conventional merger analysis. Katz and Shelanski advocate for ―fact-intensive, case-by-case inquiries" of the mergers where innovation is at stake as opposed to a conventional presumption-based approach that favors competitive pressure in the R&D market in order to ensure innovation.[69] The EU follows the ―future markets"[70] concept, or as mentioned in the Horizontal Cooperation Guidelines the ―competition in innovation" concept, in order to assess the effect of M&A on R&D in future markets.[71]

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[68] Dennis W Carlton, *Revising the Horizontal Merger Guidelines*, 6(3) J. Comp. Law & Economics 619–652 (2010); see also, Katz & Shelanski, *supra* n. 67.

[69] Katz & Shelanski, *supra* n. 67. The authors propose ―In summary, consolidation can cause harm [to innovation] depending on the particular facts of the case, and we think those facts should, therefore, become central to the merger analysis." The authors, however, favor a presumption in favor of finding a reduction in innovation in merger to monopoly cases. See also, Dennis W. Carlton, *supra* n. 68.

[70] For example, see Case No. IV/M.737–*Ciba-Geigy/Sandoz* (1996) OJ L 201/1 (1997). (para. 42 and 44).

[71] Guidelines on the applicability of Art. 81 of the EC Treaty to horizontal cooperation agreements, OJ C 3/2 (2001); to see how innovation is accounted for in mergers in EU see Pablo Ibáñez Colomo, *Restrictions on Innovation in EU Competition Law*, Forthcoming, 41 European Law Rev. (2016).

The second case in which innovation acquires importance is, when innovation is alleged as an efficiency to counter the potential consumer harm resulting from rise in market power. This part scrutinizes the latter cases, in the context of emerging markets, when efficiency (including innovation) is claimed to redeem a merger or acquisition that may otherwise lead to high concentration in the pharmaceutical market. Competition law does not operate in vacuum. It cannot be oblivious of the underlying economic environment. Thus, a choice between static and dynamic efficiency may be totally based upon the prevailing economic environment in a specific sector. However, competition law has a normative aspect as well—that is to nudge the sector towards innovation, as innovation has the potential to foster more welfare than static efficiency.[72] Nevertheless, as argued in Part A, even while advancing normative propositions, the law cannot be completely divorced from the prevailing socio-economic reality of the sector and institutional reality of the jurisdiction. The following discussion, therefore, discusses only those issues pertaining to an efficiency defense that are influenced by socio-economic reality of the pharmaceutical sector and the institutional environment of competition enforcement in emerging markets. However, it is important first to see the changing treatment of efficiency claims in merger assessment.

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[72] R.M. Solow, *Technical Change and the Aggregate Production Function*, 39(3) Rev of Economics and Statistics 312–320 (1957); G.M. Grossman & E. Helpman, *Endogenous Innovation in the Theory of Growth*, 8(1) J of Economic Perspectives 23–44 (1994); D.B. Audretsch, W.J. Baumol& A.E. Burke, *Competition Policy in Dynamic Markets*, 19(5) Int J of Industrial Organization 613–634 (2001).

3.1. Rising significance of efficiency claims

The efficiency claim/defense has gradually started finding its formal place in the competition assessment of mergers, not only in mature jurisdictions but also in emerging markets. In EU, there was no formal recognition of efficiency before the revision of the Merger Regulation and the Horizontal Merger Guidelines in 2004.[73] In US, efficiency claims in mergers have been formally recognized since the 1982 merger guidelines.[74] The US judiciary has gradually started taking efficiency into account in merger cases.[75] In US, dynamic efficiency consideration played an important role in the FTC's analysis of the proposed Genzyme/Novazyme merger.[76] In EU, a more ~~"e~~effect based" or ~~"m~~more economic approach" test warrants due recognition of efficiency claims.[77] Both EU and US have

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[73] See EU Horizontal merger guidelines, *supra* n. 46; Art 2(1)(b) of Council Regulation (EC) 139/2004 of 20 Jan. 2004 on the Control of Concentrations between Undertakings (the ECMR) [2004] OJ L24/1.

[74] U.S. Dep't of Justice, Merger Guidelines, 47 Fed. Reg. 28,493 (1982), reprinted in 71 CALIF. L. REv. 649 (1983).

[75] For example, see US–*FTC v. University Health, Inc.,* 938 F.2d 1206 (11th Circuit 1991); *FTC v. Butterworth Health Corp.,* 121 F.3d 708 (6th Circuit 1997); *FTC v. Tenet Health Care Corp.,* 186 F.3d 1045 (8th Circuit 1999); *FTC v. H.J. Heinz* Co., 246 F.3d 708 (D.C. Circuit 2001).

[76] Federal Trade Commission, *FTC Closes its Investigation of Genzyme Corporation's 2001 Acquisition of Novazyme Pharmaceuticals*, Federal Trade Commission, https://www.ftc.gov/news-events/press-releases/2004/01/ftc-closes-its-investigation-genzyme-corporations-2001 (accessed 7 Mar. 2016); see also D.L. Wald & D.L. Feinstein, *Merger Enforcement in Innovation Markets: The Latest Chapter – Genzyme/Novazyme*, The Antitrust Source, 1–11(2004), http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/Jul04_Feinstein7_23.authcheckdam.pdf (accessed 16 Mar. 2016).

[77] See, ©OECD, *The Role of Efficiency Claims in Antitrust Proceedings*, 2012, http://www.oecd.org/competition/EfficiencyClaims2012.pdf (accessed 7 Mar. 2016).

come a long way since the time when efficiency was seen not as a justification for a merger, but rather as an offence.[78]

Several emerging markets as well mention efficiencies in their competition legislation in the overall assessment of mergers.[79] Efficiency has been taken into consideration in the M&A analysis by the South African competition tribunal. In the merger between Trident Steel (Proprietary) Limited and Dorbyl Limited,[80] the competition tribunal approved a merger relying on productive efficiency gains, even when the combined market share of the entities was around 70%. The tribunal had initially agreed that the merger would result in a substantial lessening of competition in the relevant market. Surprisingly the tribunal adopted an ―inverse sliding scale test."[81] This test means that the stronger the real efficiencies, the lesser the need will be for the parties to show that they will pass on to consumers the benefits of the efficiencies.[82] Efficiencies were alleged in the *AMBEV* case in Brazil; however, considering the speculative nature of the claimed

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[78] Efficiency was treated as an offence in US in *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962). There have been several merger cases in EU where efficiencies were relied upon to prove anticompetitive effects, for example, see *AT&T / NCR* (Case IV/M.50).

[79] For example, s. 12A(1)(a)(i) of the South African Competition Act provides for efficiency defense in merger. Similarly s. 20(4) of the Indian Competition Act, 2002 mentions efficiency in evaluating the net effect of mergers.

[80] Trident Steel (Proprietary) Limited (―Trident Steel") and Dorbyl Limited (―Dorbyl"), approval Decision of 30 Jan. 2001, case 89/LM/Oct00 <http://www.comptrib.co.za/assets/Uploads/Case-Documents/89LMOCT00.pdf> (accessed 7 Mar. 2016).

[81] See, Geoff Parr, *The Treatment of Efficiencies in South African Merger Consideration*, in , *Economic Theory and Competition Law*, 81 (Josef Drexl, Laurence Idot&JoëlMonéger (eds), Edward Elgar, 2009).

[82] Trident Steel and Dorbyl, *supra* n. 80 para. 81.

efficiencies they were not accepted.[83] In the *NESTLÉ/ GAROTO* acquisition case[84] in Brazil, out of the alleged twelve productive efficiencies, only three (reduction of costs with closing of deposits, reduction of costs with packing and gain with renegotiation of freight) were accepted. In this case, efficiencies were not enough to offset the possible harm to consumer welfare because of increase in market power. In the *CVRD X Ferteco/Caemi/ Socoimex/Sa-mitri*[85] case, also in Brazil, efficiencies were recognized and the merger was approved with remedies. In all these cases, the efficiencies claimed were either allocative or productive. Further, in no case did alleged efficiencies alter the finding about anticompetitive effects of a merger and, accordingly, remedies were adopted.[86]

3.2.What efficiencies to account for

A merger can have several efficiencies including economies of scale, resource allocation, technological complementarities, specialization in product line, reduction in transportation costs, various kinds of transaction-cost economies, reduced capital

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[83] AC No. 08012.005846/99-12; for an analysis of this case, see Paulo Correa &FredericoAguiar, ―Merger Control in Developing Countries: Lessons from the Brazilian Experience," UNCTAD/DITC/ CLP/Misc.24.

[84] AC no. 08012.001697/2002-89. Nestlé BrasilLtda e Chocolates Garoto S/A. See also, Marco Botta, Merger Control Regimes in Emerging Economies: A Case Study on Brazil and Argentina (Wolters Kluwer, 2011), 217.

[85] AC no. 08012.000640/2000-09.Companhia Vale do Rio Doce – CVRD e MineraçãoSocoimex S/A.

[86] © OECD Roundtable on Dynamic Efficiencies in Merger Analysis, Note by Brazil, DAF/COMP/WD(2007)83 <http://academico.direito-rio.fgv.br/ccmw/images/e/ed/SEAE_Efficiencies_Brazil_Merger_Analysis.pdf> (accessed 7 Mar. 2016).

costs, product line specialization, the deployment of scarce managerial talent across a wider portfolio of assets, and better combination of R&D skills and resources for innovation, to name a few.[87] These efficiencies may be allocative, productive and dynamic. Several antitrust scholars have argued in favor of dynamic efficiency.[88] Dynamic efficiency is not a luxury that only developed nations can afford to pursue. Instead, even developing countries may pursue dynamic efficiency through competition policy.[89] So far as promoting innovation through competition law is concerned, the nationality of the pharmaceutical firms does not matter, at least in the competition assessment. In case of a merger, what actually matters is the likelihood of consumer harm, both in the short run and long run. The issue here is to what extent the loss in

[87] For a discussion on efficiencies, see Alan A. Fisher & Robert H. Lande, *Efficiency Considerations in Merger Enforcement*, 71 Calif. L. Rev. 1580 (1983); OECD (2012), *supra* n. 72; see also, Vikas Kathuria, *A Conceptual Framework to Identify Dynamic Efficiency*, forthcoming, European Competition Journal (2015).

[88] J.F. Brodley, *The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress*, 62 New York U Law Rev 1020–1053(1987); Michael E. Porter, *Competition and Antitrust: A Productivity-Based Approach to Evaluating Mergers and Joint Ventures*, 46(4) Antitrust Bulletin, 919–958 (Winter 2001); P. Evans, *In Search of the Marginal Consumer: The FIPRA Study*, FIPRA Group (2008); D.B. Audretsch, W.J. Baumol& A.E. Burke, *Competition Policy in Dynamic Markets*, 19(5) Int J of Industrial Organization 613–634 (2001); see also © OECD, Dynamic Efficiencies in Merger Analysis, DAF/COMP(2007)41, http://www.oecd.org/competition/mergers/40623561.pdf (acc-essed 7 Mar. 2016).

[89] See, A. Singh, *Competition and Competition Policy in Emerging Markets International and Developmental Dimensions*, G-24 Discussion Paper Series, No. 18 (September 2002), http://unctad.org/en/docs/gdsmdpbg2418_en.pdf (accessed 7 Mar. 2016).

short run welfare may be superseded by the long run gains through innovation.

The 1999 merger between Hoechst Marion Roussel and Rhône-Poulenc Rorer in EU, which created Aventis, was successful in achieving productive efficiencies. Cost savings were realized by closing down several manufacturing plants and one R&D facility. R&D was outsourced to research organizations, biotechnology companies and other partners.[90] The 1995 acquisition of Burroughs Wellcome by Glaxo also experienced such efficiencies.[91] In the Léčivaand Slovakofarma merger in the Czech Republic, the competition agency accepted that there would be dynamic efficiencies arising out of rationalization in the research and development of generic products.[92] These are just a few examples of mergers that demonstrated various efficiencies.

3.3.The correct welfare standard for developing countries

There are several welfare standards ~~–t~~hat assign weights to the different groups of market participants."[93] Simply put, welfare standards decide the distribution of wealth between consumers and producers.[94] In a developing country, the right standard

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[90] Andrew D. James, *The Strategic Management of Mergers and Acquisitions in the Pharmaceutical Industry: Developing a Resource-based Perspective,* 14(3) Technology Analysis & Strategic Management, 299-313(2002).

[91] *Ibid*.

[92] For a discussion on this case, see OECD (2007) (n. 88), p. 126.

[93] Miguel De la Mano, *For the customer's sake: the competitive effects of efficiencies in European merger control*, EC Enterprise Papers No. 11 (2002); Some common welfare standards are– Price Standard, Consumer Surplus Standard, Total Surplus Standard, Hillsdown Standard and Weighted Surplus Standard.

[94] A discussion on these standards is beyond the scope of this article. The reader may refer to the OECD paper on Dynamic Efficiency, *supra* n.

for analyzing mergers is the consumer welfare standard, as there is little chance that the gains made by producers/manufacturers will be passed on to consumers through capital markets. Scherer argues that the total welfare standard as proposed by Williamson may not be good for developing countries for two reasons: (1) high unemployment rates, and (2) the Keynesian liquidity trap.[95] As the incidence of unemployment is high in developing countries, it cannot be said with certainty that efficiencies would pass on from producers (here, those who are employed) to consumers. Another feature of emerging markets is that firm ownership is highly concentrated.[96] Thus, gains made by producers may not be widely distributed in society.

Alternatively, the Balancing Weights approach can also suit the socio-economic reality of emerging markets. The Balancing Weights approach allows discretion to the adjudicating authorities, to determine the effects of wealth transfer for the society in the particular circumstances of a

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77; see also, An Renckens, *Welfare Standards, Substantive Tests, and Efficiency Considerations in Merger Policy: Defining the Efficiency Defense*, 3(2) J. Competition Law and Economics149–179 (2007).

95 *Merger Efficiencies and Competition Policy*, note by Professor F.M. Scherer in OECD (2012), *supra* n. 77; Russell Pittman argues in favor of consumer welfare standard for all jurisdictions, See, Russell Pittman, *Consumer Surplus as the Appropriate Standard for Antitrust Enforcement*, Economic Analysis Group Discussion Paper, EAG 07-9 (June 2007).

96 Ruth V. Aguilera, Luiz Ricardo Kabbach-Castro, Jun Ho Lee &Jihae You, Corporate Governance in Emerging Markets, G. Morgan & R. Whitley (eds), Capitalisms and Capitalism in the twenty-first Century, 319–344 (Oxford University Press 2012), http://ssrn.com/abstract= 1806525 (accessed 7 Mar. 2016) Their dataset is based on19, 969 firms, observed between 2004 to 2008 in six emerging markets.

merger.[97] In application, this approach recognizes that if consumers are poor, the adjudicating body will have more reasons to see the wealth transfer from consumers to producers as anticompetitive.[98] Since the *Superior Propane* case,[99] the Balancing Weights approach is the standard for evaluating mergers in Canada. However, the case-by-case approach is quite difficult to apply and is highly costly in practice.[100]

Adhering to the consumer welfare standard (and/or requiring that some of the gains should be passed on to the consumers) means that efficiency gains from fixed costs should be looked upon less favorably.[101] This is so because fixed cost savings, for example resulting from lower duplication costs, are less likely to have effects on prices. Thus, they do not positively change the consumer welfare.[102] Several commentators have criticized the less favorable treatment of fixed cost in competition law.[103]

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[97] *The Commissioner of Competition v. Superior Propane Inc*., 2000 Comp.Trib. 15, para. 431.

[98] See, Edward Iacobucci & Michael Trebilcock, *The Competition Law System and the Country's Norms*, The Design of Competition Law Institutions: Global Norms, Local Choices, 120 (Elanor M. Fox and Michael J. Trebilcock (eds.), Oxford, first edition 2013).

[99] *Canada (Commissioner of Competition) v. Superior Propane Inc. (C.A.)*, 2003 FCA 53, [2003] 3 F.C. 529.

[100] Louis Kaplow, *On the Choice of Welfare Standards in Competition Law*, Daniel Zimmer (ed.), The Goals of Competition Law, 9 (Edward Elgar, Cheltenham, 2012).

[101] Massimo Motta, *Competition Policy: Theory and Practice*, 241 (Cambridge University Press 2004).

[102] *Ibid*.

[103] Katz &Shelanski, *supra* n. 67; GS Cary, *Efficiencies in Merger Analysis: From Both Sides Now Testimony to the Antitrust Modernization Commission*, (17 Nov. 2005) Testimony to the Antitrust Modernization Commission, http://govinfo.library.unt.edu/amc/commission_hearings/pdf/Statement_Cary_final.pdf (accessed 7 Mar.

3.4.Merger to monopoly

Can a merger to monopoly be redeemed on the basis of efficiency claims in emerging markets? This question becomes important, as in emerging markets, concentration levels may be high in general, and in pharmaceutical sector in particular owing to high entry barriers because of very high R&D and marketing costs.[104]Pitofsky, in his remarks on the occasion of the tenth anniversary of the EU merger regulation, observed that efficiencies should be taken into account in ―close cases."[105] By ―close cases" he meant those mergers that do not lead to monopoly or near-monopoly. Going by the established precedents in the *Continental Can*,[106]*GlaxoSmithKline*[107] and *Intel*[108] cases, it may not be possible to do so in EU, as the existing case law still stresses ―maintenance of effective competition"[109]to ensure that market structure is protected

2016); Antitrust Modernization Commission, *Report and Recommendations*, (2007), http://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf (accessed 7 Mar. 2016).

[104] AstraZeneca, *supra* n. 45, para. 565.

[105] Robert Pitofsky, *EU and U.S. Approaches to International Mergers– Views from the U.S. Federal Trade Commission*, Remarks before EC Merger Control 10th Anniversary Conference, The European Commission Directorate General for Competition, International Bar Association, https://www.ftc.gov/public-statements/2000/09/eu-and-us-approaches-international-mergers-views-us-federal-trade (accessed 7 March 2016)

[106] Case 6/72, *Europemballage Corporation and Continental Can Company Inc. v. Commission of the European Communities* [1973] ECR 215, paras 24 and 25.

[107] Joined Cases C-501/06 P, C-513/06 P, C-515/06 P and C-519/06 P *GlaxoSmithKline Services and Others v. Commission and Others* [2009] ECR I-9261. para. 63.

[108] Case T-286/09, *Intel Corp. v. European Commission* EU:T:2014:547, para. 105.

[109] *Continental Can* case, *supra* n. 106, para. 25.

without establishing whether actual consumer harm may occur or not. This has partly to do with the Ordoliberalism heritage of the past that still finds its traces in the Community legislation and cases.[110] The EU horizontal merger guidelines express the same sentiments:

It is highly unlikely that a merger leading to a market position approaching that of a monopoly, or leading to a similar level of market power, can be declared compatible with the common market on the ground that efficiency gains would be sufficient to counteract its potential anti-competitive effects.[111]

Nevertheless, the Commission accepted efficiencies in a three to two merger in *Korsnäs/AssidomänCartonboard*.[112] In the US, while there is no formal prohibition against merger to monopoly, in practice there is a strict view against authorizing any such merger to monopoly.[113]

Recently, liberalized markets may also be influenced by a socialist overhang. Article 38(c) of the Indian constitution directs the State to ensure that ~~t~~the operation of the economic system does not result in the concentration of wealth and means of production to the common detriment." Such a provision may be a motivation for a formalistic approach to competition law, resulting in protecting competitors rather than protecting competition.

The relationship between market structure and innovation is unclear. Thus, it should not matter if the merger results in monopoly, so long as the parties can prove a strong possibility

[110] For example Art 101(3) of TFEU.
[111] Horizontal mergers guidelines, *supra* n. 46, para. 84.
[112] Case COMP/M. 4057 Korsnäs/Assidomän Cartonboard (2006).
[113] Herbert Hovenkamp, Federal Antitrust Policy, *The Law of Competition and Its Practice*, 556 (Thomson Reuters, 2011, fourth edition).

to achieve efficiency. Especially in those sectors where the MES is very high, simply relying upon the number of competitors as a proxy for competition may not be the right strategy. In this regard, the *Novazyme/Genzyme* merger is extremely relevant.[114] Even though the merger was leading to a monopoly, the FTC decided not to challenge the merger. Chairman Timothy Muris was of the view that there was no evidence of the effect of concentration on innovation. Thus, he opined, ~~"o~~ne must examine whether the merged firm was likely to have a reduced incentive to invest in R&D, and also whether it was likely to have the ability to conduct R&D more successfully."[115]

South Africa allowed a merger between Trident Steel (Proprietary) Limited and Dorbyl Limited based on efficiencies, even though it was a merger to monopoly.[116] Also, the South-African Competition Appeal Court (CAC) approved a three to two merger between Pioneer Hi-Bred International, a US-based seed company, and Pannar Seed Limited, a South African seed company, on the basis that the merger would foster innovation.[117]

The analysis taken by the Commerce Commission of New Zealand in the *Cavalier Wool Holdings* case presents a good blueprint to deal with efficiencies properly in a merger to monopoly case.[118] In this case, WSI (the acquired company)

[114] *Novazyme/Genzyme*, *supra* n. 76.
[115] Statement of Chairman Timothy J. Muris, *supra* n. 66, p. 6.
[116] Case Number: 89/LM/Oct00.
[117] *Pioneer Hi-bred International Inc and Another v. Competition Commission and Another* (113/CAC/NOV11) [2012] ZACAC 3 (28 May 2012).
[118] Cavalier Wool Holdings Limited and New Zealand Wool Services International Limited, Decision No. 725, 9 Jun. 2011.

would have been removed as an independent post-merger supplier of wool scouring services in each of the affected wool scouring markets, leaving Cavalier Wool (the acquirer) as the only provider. The Commission recognized that the Chinese scouring industry posed a significant long-term competitive threat to the domestic wool scouring industry in New Zealand.[119]

So far as the possibility of a new entry was concerned, the authority employed a LET (Likelihood of entry, Extent of entry and Timeliness of entry) test, and was convinced that entry would not occur without at least a 5%–10% increase in scouring prices.[120] The Commerce Commission was thus convinced about the possibility of consumer harm. However, the Commission also looked into whether efficiency gains from the merger could mitigate consumer harm, and found that the possible losses were very small.[121] Further, the Commission found that the threat of competition from the Chinese scouring industry would reduce potential dynamic efficiency losses.[122] Additionally, the Commission was satisfied that the merger would result in productive efficiency gains.[123] The Commission then balanced the benefits and losses and, looking at the net result of the transaction, was of the view that the public benefits were likely to significantly outweigh the public losses.

Thus, there should not be a straightjacket formula in cases of merger to monopoly. Transactions should be prohibited when there is a likely consumer harm that cannot be offset by efficiencies.

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[119] *Ibid.*, para. 128.
[120] *Ibid.*, 185.
[121] *Ibid.*, para. 276.
[122] *Ibid.*, para. 289.
[123] *Ibid.*, para. 392.

3.5. When the consumer harm and efficiencies occur in different markets

One very crucial issue related to efficiency claims is the treatment of efficiencies when consumer harm and efficiencies occur in different markets. Technically, in such a case there are two different groups of consumers. In EU, cross-market efficiencies or ―out-of-market" efficiencies can be accepted if the two markets are related and harm from competition restriction and efficiency gains occur to the same consumers.[124] In US, courts have generally declined ―out-of-market" efficiencies.[125] However, there have been instances where ―out-of-market" efficiencies were recognized.[126] The 1997 and 2010 US Horizontal merger guidelines have taken a less strict view.

―*In some cases, however, the Agencies in their prosecutorial discretion will consider efficiencies not strictly in the relevant market, but so inextricably linked with it that a partial divestiture or other remedy could not feasibly eliminate the anticompetitive effect in the relevant market without sacrificing the efficiencies in the other market(s). Inextricably linked efficiencies are most likely to make a difference when*

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[124] Guidelines on the application of Art.81(3) of the Treaty (2004/C 101/08), para. 43; see also CASE COMP/AT.39595 – Continental/United/Lufthansa/Air Canada, paras 74–76.

[125] *United States v. Philadelphia National Bank*, 374 U.S. 321, 370, 83 S.Ct. 1715, 745 (1963); *United States v. Bethlehem Steel Corp*.,168 F. Supp. 576, 618 (S.D.N.Y. 1958); *United Nuclear Corp. v. Combustion Eng'g*, 302 F. Supp. 539, 554–555 (E.D. Pa. 1969).

[126] Gai's–United States Bakery (DOJ 1996), where in light of the specific facts of the case cross-market efficiencies were allowed. Once again in Genzyme–Ilex (FTC 2004) merger the FTC recognized ―out-of-market" efficiency and tailored remedy for the market where anticompetitive effects were a concern.

they are great and the likely anticompetitive effect in the relevant market(s) is small so the merger is likely to benefit customers overall."[127]

In the case of a pharmaceutical merger, avoiding anticompetitive effect in the affected market may be possible through divestiture. However, divestiture may not be possible if two products (two different markets), showing anticompetitive effects and efficiency respectively, are manufactured in the same plant, or when they are complements (and possibly demonstrate economies of scope).[128]Hovenkamp suggests that there can be an exception in the case of cross-market efficiency, where the market in which efficiency results is significantly larger than the market in which competition is threatened.[129]

Pitofsky highlights the difficulties in balancing cross-market efficiencies:

I have come increasingly to the view that it is not practical in run-of-the-mill merger cases to trade off pro- and anti-competitive effects across markets. Imagine the measurement problems of an increase in market shares from 20 to 30% in market A compared to a 5% decrease in marginal cost (assuming marginal cost were somehow knowable) in market B. There is not presently a practical formula available to

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[127] Footnote 14, US Horizontal Merger Guidelines, U.S. Department of Justice and the Federal Trade Commission 2010 <https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf> (accessed 7 Mar. 2016); see also, U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines § 4 n. 36 (1992, rev. 1997) <http://www.justice.gov/atr/public/guidelines/hmg.pdf> (accessed 7 Mar. 2016).

[128] See, Herbert Hovenkamp, *supra* n. 113, 556.

[129] *Ibid.*

enforcement agencies or courts that would allow that kind of trade-off to be made.[130]

Even if such a formula were available, it would be difficult to apply it in the special setting of pharmaceutical industry and emerging markets, as the consumer groups in both the markets may have difference in purchasing power. Pitofsky, however, accepts that in the closely related market, such as pen and ink, where the same consumer uses both products, cross-market efficiencies can be accepted.[131]

The following example demonstrates the theoretical problems in considering cross-market efficiencies in two different pharmaceutical markets in emerging countries. Let us assume a hypothetical merger between two drug companies. The competition agency alleges anticompetitive effects in market A, where the joint market shares will be very high post-merger. Also, this is a drug that has a very wide use. However, the firms claim efficiency in the market B, where the drug will have very limited use, owing to the smaller number of users affected by the concerned disease. In emerging markets, balancing such efficiency gains against the consumer harm will be extremely difficult. In such a scenario, basing the decision solely on aggregate welfare of the society may not be socially desirable, as there are widespread disparities in the society. Any such solution will raise doubts over the sanctity and rationale of competition law in emerging markets.

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[130] Robert Pitofsky, *Efficiencies in Defense of Mergers: 18 Months after*, The George Mason Law Review Antitrust Symposium: The Changing Face of Efficiency Washington, D.C. (1998) <https://www.ftc.gov/public-statements/1998/10/efficiencies-defense-mergers-18-months-after> (accessed 7 Mar. 2016).

[131] *Ibid.*

3.6.Appropriate institutional environment

Merger analysis is a sophisticated art. And efficiency claims make it even more complex and sophisticated. Most competition agencies are cautious in their evaluation of efficiency claims, as information about potential efficiency gains in mergers is solely in the merging firms‘ possession.[132] The standard of proof in order to appreciate efficiency concerns is very high. Further, R&D competition in general is more complicated than price competition with unpredictable incentives, path of progress and outcomes.[133] Thus, naturally, the competition agencies are skeptical about efficiency claims in mergers.

Criticizing the EU decision on the GE/Honeywell merger, Morgan and McGuire highlight the importance of institutional capacity by noting ―an under-resourced bureaucracy working to tight time scales and with a high level of autonomy can clearly face problems in trying to arrive at consistently well-judged decisions and in being seen to do so.”[134]

Crane notes several reasons for asymmetric treatment of merger efficiencies as compared to merger harms.[135]He argues ―[a]ntitrust regulators may react asymmetrically to potential losses and gains. It is well established in behavioral theory that decision makers, including regulators, sometimes weight potential losses more than potential gains of an equivalent

[132] © OECD (2012), *supra* n. 77.

[133] Richard T. Rapp, *The Misapplication of the Innovation Market Approach to Merger Analysis*, 64(1) Antitrust L.J. 19-47 (1995).

[134] Eleanor Morgan & Steven McGuire, *Transatlantic Divergence: GE–Honeywell and the EU's Merger Policy*, 11(1) J. European Public Policy, 53, 39–56 (2004).

[135] Daniel A. Crane, *Rethinking Merger Efficiencies*, 110(3) Mich L. Rev. 347-91 (2011).

magnitude."[136] Arguably a new antitrust body is more loss averse than the mature ones who have already proven their worth.

Merger assessment in competition law is by and large predictive in nature. It leaves open gaps through which ideological interventions may subordinate pure economic reasons. Commenting upon merger control program in developing countries, Correa and Aguiar note, "[b]ecause merger control activities affect market structure and firm behaviour in all industries, they also seem to be a propitious environment for the reintroduction of interventionist ideologies – from price controls to picking winners."[137] Against this backdrop in emerging markets, guidelines on merger review can be a good way to discourage ideological deviations and set out an analytical framework. The Public-Choice literature also indicates that antitrust regulators may make sub-optimal decisions motivated by self-interest.[138] An analytical framework in the form of guidelines may provide a check against such self-serving behavior.

Judicial review is a crucial part of the antitrust institutional fabric. The US judiciary has played a very significant role in

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[136] *Ibid.*, citing Roger G. Noll & James E. Krier, *Some Implications of Cognitive Psychology for Risk Regulation*, 19 J. LEGAL STUD. 747–779 (1990).

[137] Paulo Correa & Frederico Aguiar, *Merger Control in Developing Countries: Lessons From the Brazilian Experience*, UNCTAD/ DITC/CLP/Misc.24,page1(2002) <http://unctad.org/en/Docs/ditcclpmisc24_en.pdf> (accessed 7 Mar. 2016).

[138] W.F. Shughart II, *Public-Choice Theory and Antitrust Policy*, F.S. McChesney& W.F. Shughart II (eds.), The Causes and Consequences of Antitrust: The Public-Choice Perspective, 7 (The University of Chicago Press 1995).

the evolution of antitrust jurisprudence.[139]Baye and Wright in their empirical analysis reach the conclusion that some antitrust cases are too complicated for generalist judges.[140] Rivera and Schatan also recognize that judges may not be prepared to handle cases of great technical complexity, which may cause problems for the effective resolution of competition cases.[141] Assuming that the antitrust regulators in emerging markets have adequate financial and human resources, are free from political intervention and are committed to the cause of promoting consumer welfare, there can still be problems with the successful enforcement of competition law if the judiciary does not share the same commitment and appreciation for competition law.

3.7.Cautions

The above discussion has highlighted a few issues that are critical in the efficiency defense in emerging markets. Since the theoretical framework in this article argues that the application of competition principles is sector-specific, the pharmaceutical sector was chosen as an example. This section points out certain cautions in the efficiency defense that should be heeded in emerging markets.

The EU Horizontal Merger Guidelines define countervailing buyer power as ~~t~~the bargaining strength that the buyer has vis-à-vis the seller in commercial negotiations due to its size, its commercial significance to the seller and its ability to switch

[139] See, D. Daniel Sokol, *Antitrust, Institutions, and Merger Control*, 17 Geo. Mason L. Rev. 1055 (2009–2010).

[140] Michael R. Baye & Joshua D. Wright, *Is Antitrust Too Complicated for Generalist Judges? The Impact of Economic Complexity and Judicial Training on Appeals*, 54(1) J. Law & Economics, 1–24 (February 2011).

[141] Schatan & Rivera, *supra* n. 17, p. 35.

to alternative suppliers."[142] Powerful buyers can exercise countervailing power and thus may negotiate favorable terms from their suppliers. The antitrust literature recognizes buyer power as a mitigating factor in merger analysis.[143] Most emerging markets do not have sophisticated health insurance systems. In India, for example, any form of social or voluntary health insurance covers only about 10% of the population.[144] Thus, insurers are not available to intervene on behalf of buyers to constrain pharmaceutical prices.[145] Such intervention by the insurer would be very helpful as the health care sector suffers from information asymmetry. Since consumers in emerging markets have little or no buyer power so far as the pharmaceutical sector is concerned, efficiency must be analyzed in this context. Furthermore, where the pharmaceutical industry is concentrated because of high entry barriers and high economies of scale, to impress the competition agency, efficiencies should be big enough to negate any anticompetitive effect.

Section VII of the EU Guidelines on the assessment of horizontal mergers recognizes efficiencies only when the

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[142] EU Horizontal mergers guidelines *supra* n. 46, para. 64.

[143] U.S. Dep't of Justice & FTC, Horizontal Merger Guidelines §8 (2010); EU Horizontal mergers guidelines *supra* n. 46, Section V; See also, John B. Kirkwood, *Powerful Buyers and Merger Enforcement,* 92 Boston University Law Review 1485 (2012).

[144] Y. Balarajan, S. Selvaraj& S.V. Subramanian, *Health Care and Equity in India*, The Lancet 377 (9764), 505–515 (5–11 Feb. 2011), http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(10)61894-6.pdf (accessed 16 Mar. 2016).

[145] To see how insurers intervene on behalf of the insured patients, see Christopher J. Sroka, *Prescription Drugs: Pricing Differences between Insured and Uninsured Consumers*, Ethan N. Parvis (ed.), The Pharmaceutical Industry: Access and Outlook, 23 (Nova Science Publishers, Inc., 2002).

following three cumulative criteria are met: (1) efficiencies must benefit consumers; (2) efficiencies must be merger-specific; and (3) efficiencies must be verifiable.[146]Here there are serious questions that arise from the efficiency claims in emerging markets. Will there be really a new product hitting the local market? Will there be a timely entry of the drug in the affected market? So far as availability of a new drug is concerned, it will depend upon the business model of the foreign multinational company. The foreign MNC may choose to introduce the product in other more profitable markets. In emerging markets what are the possibilities that the innovation will pass on to consumers? These questions depend a lot upon the nature of manufacturing, the drug type and the business model of the defendant firms. Therefore, the competition authorities should take such factors into account while dealing with efficiency claims.

4. Conclusion

Pharmaceutical M&As in emerging markets have given rise to concerns regarding the elimination of generics firms. Undoubtedly, such elimination would have detrimental effects on welfare, and thus might motivate competition agencies to use competition law as an industrial policy tool to deter the acquisition of generics firms. This issue was the first motivation behind this article. Relying upon the concept of potential competition, the article shows how competition law tools themselves can ensure consumer welfare, which is the cardinal goal of competition law. In doing so, the article has argued against tweaking competition law and reducing it to a mere industrial policy tool in emerging markets. The article has not attempted to outline the goals of competition law in developing countries. Even a mature jurisdiction such as EU

[146] EU Horizontal mergers guidelines *supra* n. 46.

has multiple objectives, which may be often conflicting.[147] However, while analyzing the first issue, it has been argued that competition law should not be used as an industrial policy tool to protect local manufacturers.

The second motivation was to see how efficiency claims/defenses in mergers would play out in the context of emerging markets. In this regard, this article has sought to make a contribution to the more positive treatment of efficiency claims in emerging markets. In order to analyze these issues, the article has taken the example of pharmaceutical mergers for two reasons. First, there has been a rise in pharmaceutical M&As in emerging markets; and second, efficiency claims are more relevant in high technology sectors such as the pharmaceutical industry. To analyze these issues, it was important to develop a theoretical framework to see what changes are required in competition law enforcement in the peculiar context of emerging markets. The framework shows that the application of competition law is sector-specific and is guided by the socio-economic realities of a sector and the institutional realities of a particular jurisdiction.

[147] See Laura Parret, *The Multiple Personalities of EU Competition Law: Time for A Comprehensive Debate on its Objectives*, Daniel Zimmer (ed.), The Goals of Competition Law, 61 (Edward Elgar, Cheltenham, 2012).

CHAPTER 5

Competition Law and Compulsory Licenses in Emerging Markets: A Systems of Innovation Approach

Compulsory licenses in competition law have been criticized primarily for their detrimental effect on incentives to innovate. Dynamic efficiency including innovation has the better potential to foster economic welfare as compared to static efficiency, thus it should be the preferred policy choice. For almost a century researchers from economics and management disciplines have attempted to explore the conditions that are conducive to technological innovation. Conventionally, adequate incentives to innovators are considered cardinal for supporting innovation. However, innovation is a complex process that goes beyond merely creating incentives for the private sector. This paper by relying on the Systems of Innovation (SI) approach investigates the Brazilian and Indian pharmaceutical sector and demonstrates the differences in innovative capability in these two jurisdictions. Whereas, the Indian pharmaceutical industry has moved up the R&D value chain, its Brazilian counterpart, by and large, is still in the phase of imitation. The paper uses this difference to draw a prescription for compulsory licenses under competition law in Brazil and India.

Introduction

A government grants compulsory license or non-voluntary license to a third party to use the patent without the permission of the right-holder.[1] A compulsory license, be it

[1] Robert C. Bird, ―Developing Nations and the Compulsory License: Maximizing Access to Essential Medicines While Minimizing Investment Side Effects" (2009) 37(2) The Journal of Law Medicine & Ethics 209-21.

under Intellectual Property (IP) law or competition law, presents a dilemma between short-term gains and long-term losses. Common sense suggests that although in the short run, a compulsory license may ensure cheaper access, in the long run, however, it may have detrimental effects on incentives to innovate. It is noteworthy that most of the emerging markets have only recently adopted competition law.[2] So far it is not clear as to what objectives competition law should pursue in emerging markets.[3]The peculiar socio-economic realities in developing countries have led some scholars to argue that competition law can also be employed to pursue social objectives.[4]Further, whereas in recent times considerable attention has been dedicated to the role that competition law can play in furthering technological innovation, the scholarship that explores the

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[2] This paper uses the terms ‗developing countries' and ‗emerging markets' interchangeably.

[3] Indeed, even in developed countries the goals of competition law are not set in stone. See, Laura Parret, The Multiple Personalities of EU Competition Law: Time for A Comprehensive Debate on its Objectives, Daniel Zimmer (ed.), The Goals of Competition Law, 61 (Edward Elgar, Cheltenham, 2012)

[4] Josef Drexl, Consumer Welfare and Consumer Harm: Adjusting Competition Law and Policies to the Needs of Developing Jurisdictions, in Michal S. Gal et al. (eds.) *The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law* (Edward Elgar, 2015) 293; Eleanor Fox, Competition, Development and Regional Integration: In Search of a Competition Law Fit for Developing Countries, Josef Drexl et al (eds.), *Competition Policy and Regional Integration in Developing Countries* (Edward Elgar 2012) 273-290; Mor Bakhoum, 'A Dual Language in Modern Competition Law? Efficiency Approach versus Development Approach and Implications for Developing Countries' (2011) 34 (3) World Competition 495–522; M. S. Gal and E.M. Fox, Drafting competition law for developing jurisdictions: learning from experience, Michal S. Gal et al (eds.), *The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law* (Edward Elgar 2015) 296–356.

viability of the long run efficiency objective in developing countries is scarce.[5]

In theory, developing countries can also benefit from innovation, as it leads to development.[6] Thus, the aim of the policies, even in emerging markets, should be to encourage investment in innovation. However, the general backwardness of the economy makes a political choice in favor of the long run objectives difficult. Therefore, the perennial dilemma between the short run and the long run that characterizes the application of competition law is more pronounced in emerging markets. Faced with this challenge, this paper investigates the extent to which developing countries can incentivize innovative activities within the framework of, relatively new, competition law. The paper argues that in the absence of any innovative capability in a particular sector, the short run objective of ensuring cheaper prices to the consumers is the optimal solution; however, if a sector has moved up to the level of innovation, competition law should support innovation by refraining from issuing compulsory licenses in that sector.

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5 One notable example is A. Singh, "Competition and Competition Policy in Emerging Markets: International and Developmental Dimensions", G-24 Discussion Paper Series, No. 18 (September 2002)<http://unctad.org/en/docs/gdsmdpbg2418_en.pdf> (accessed 3 October 2016).

6 See in general, Jan Fagerberg, Martin Srholec and Bart Verspagen, "Innovation and Economic Development" (2009) UNU-MERIT, Working Paper Series, #2009-032. The authors observe: "In fact, the evidence shows that innovation is quite widespread among developing country firms, is associated with higher productivity (e.g., development) and, as in the developed part of the world, is dependent on web of interactions with other private and public actors."; see also, © OECD (2012), "Innovation for Development: The Challenges Ahead", in *OECD Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris. DOI <http://dx.doi.org/10.1787/sti_outlook-2012-7-en> (accessed 17 April 2016)

This research draws on the economic concept of consumer welfare. However, the main crux of the analysis is based on the Systems of Innovation (SI) approach. This approachsuggests that contrary to the traditional view of the economists, there has been recognition that innovation, which is a long run efficiency, requires much more than merely encouraging investment in R&D.[7]On one hand, the pharmaceutical sector is characterized by constant innovation, thus necessitating incentives to pursue R&D. On the other hand, for public policy reasons it is important to ensure affordable access to medicines. Thus, the pharmaceutical sector was the perfect candidate for analyzing compulsory licenses. Brazil and India were chosen for comparison as they have accumulated technological capabilities that facilitate the transition from production to innovation.[8]Further, none of these countries has so far issued compulsory license under competition law; thus, this research will assist them in making the optimal decision. The research is organized as follows. Part A of the paper is a general primer on innovation. It explains the meaning, definition, and microeconomics of innovation, and its effect on consumer welfare. Thereafter, the concept of Systems of Innovation (SI) is discussed. An understanding of how innovation materializes will have bearing on the application of competition law when innovation is an issue. Part B builds upon the previous section, and compares the innovative capability of the

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[7] For example see, Richard R. Nelson, Preface in Edurado Albuquerque et al. (eds.) *Developing National System of Innovation: University–Industry Interactions in the Global South* (Edward Elgar, Cheltenham, UK, 2015) ix. Nelson observes, ―Traditionally, economists have focused on the investment needed. They saw the problem of mastering new ways of doing things as mostly involving ―technology transfer", a term that played down the difficult learning process involved."

[8] RasmusLemaa, RuyQuadrosb and Hubert Schmitzc, ―Reorganising Global Value Chains and Building Innovation Capabilities in Brazil and India" (2015) 44(7) Research Policy 1376–1386.

Indian and the Brazilian pharmaceutical sector, as measured by ―international patents". It is crucial to note that the innovative capability may vary from sector to sector, regardless of the distinction between developed and developing countries.[9]. Part C uses the findings of the previous section to assess the viability of compulsory licensing in the Brazilian and the Indian pharmaceutical sector with respect to its effect on innovation. This part also shows that the latest jurisprudence on compulsory licensing in the EU and the US does not assist developing countries in making the optimal choice between the short run and the long run efficiency.

1. The short run and the long run consumer welfare

Let us begin with the oft-used phrase consumer welfare in competition law that is very often stated as its cardinal objective.[10] In applied welfare economics, the concept of consumer surplus is used as a measure of consumer welfare. Simply put, consumer surplus is the amount a buyer is willing to pay (based on the utility) for a good

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[9] In fact, the OECD also notes that in very large countries such as China or India, certain areas of economy can be very advanced despite the average backwardness of the economy. See, ©OECD (2012),―Innovation for Development" <http://www.oecd.org/innovation/inno/50586251.pdf> (accessed 18 February 2016);
Technological heterogeneity in different sectors in developing countries has been acknowledged by other scholars as well, see among others Shamnad Basheer and Annalisa Primi, The WIPO Development Agenda: Factoring in the ―Technologically Proficient" Developing Countries' in Jeremy DeBeer (ed.) *Implementing WIPO's Development Agenda* (Wilfred Laurier University Press, 2009) 100-117; see also, Vikas Kathuria, ―Pharmaceutical Mergers and their Effect on Access and Efficiency: A Case of Emerging Markets"(2016) 39 (3) World Competition Law and Economics Review 451-78.

[10] Sometimes, students and people new to competition law confuse consumer welfare with consumer interest as the goal of competition law. However, consumer interest can be best ensured through consumer protection legislations.

minus the amount the buyer actually pays for it.[11] Thus, consumer welfare is understood as the area between the competitive price and demand curve (see Figure 1). As opposed to consumer welfare, producer welfare is the amount a seller is paid for a good minus the seller‘s cost of providing it.[12] The area between the competitive price and the supply curve measures producer welfare (Figure 1). Another concept is total welfare, which is the sum total of consumer and producer surplus.

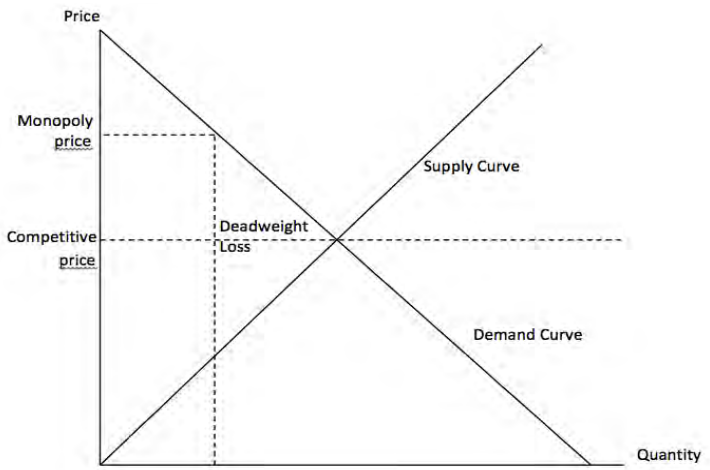

Figure 1: Consumer Surplus, Producer Surplus, and Deadweight Loss

Most of the jurisdictions follow the consumer welfare standard while deciding the distribution of wealth between consumers and producers. Steven C. Salop, through various examples, demonstrates that the true standard followed by the US antitrust legislation and courts is the ‗true consumer welfare‘ standard as opposed to the total

[11] N. Gregory Mankiw, *Principles of Economics* (6th edition, South-Western, Cengage Learning, 2012) 137; ©OECD (1993), Glossary of Industrial Organisation Economics and Competition Law, R. S. Khemani and D. M. Shapiro (eds.) <https://stats.oecd.org/glossary/detail.asp?ID=3176> (accessed 18 February 2016).

[12] ibid (Mankiw) 141.

welfare standard.[13] The EU as well proclaims consumer welfare as the objective of competition law, especially post Modernization.[14]

If one begins with the starting point that consumer welfare is the primary objective of competition law, then the effort of antitrust intervention should be directed at maximizing consumer welfare, or as mentioned above in increasing the area of the triangle between demand curve and competitive price. This may be achieved either by removing the deadweight loss or by pushing the supply curve and/or demand curve out. There is a difference, however, between the short run and long run consumer welfare. The short run consumer welfare can be achieved by minimizing the deadweight loss.[15] Allocative and productive efficiency (together termed as static efficiency) minimize the deadweight loss. The long run consumer welfare, however, is associated with dynamic efficiency that materializes in the future, and can be achieved by pushing the supply curve and/or demand curve out. Productive efficiency and dynamic efficiency both shift the supply curve out, and thus increase consumer welfare.[16] However, only dynamic efficiency can push the demand curve out, as consumers

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[13] Steven C. Salop, ―Question: What Is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard" (2010) 22 Loyola Consumer Law Review 336.

[14] Guidance on the Commission's Enforcement Priorities in Applying Article 82 EC of the EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings' (9 February 2009) C/2009 864 final (Art 82 Guidance) para 19; Guidelines on the application of Article 81 (3) of the Treaty [2004] OJ C101/ 08 para 13.

[15] F. M. Sherer, ―Antitrust, Efficiency and Progress" (1987) 62 New York University Law Rev 998–1019.

[16] T.O. Barnett, ―Maximizing Welfare Through Technological Innovation" (2008) 15 George Mason Law Rev 1191–1204; see also, Vikas Kathuria, ―A Conceptual Framework to Identify Dynamic Efficiency" (2015) 11(2-3) European Competition Journal 319-339.

ascribe more value to new products. Generally it is not possible to achieve allocative, productive, and dynamic efficiency together.[17] The choice between static and dynamic efficiency is a perennial dilemma for competition agencies, more so because dynamic efficiency may achieve more welfare than static efficiency, but in the long run.[18] Dynamic efficiency is often equated with innovation; however, the former is a broader concept than the latter as evident from the following definition:

"Dynamic efficiencies are related to the ability of a firm and its incentives to introduce new products or processes of production (or to improve existing ones) by adopting new technology or enhancing knowledge endogenously, i.e. to move the efficient frontier of production faster or further forward. Dynamic efficiencies are therefore linked to innovation, learning by doing and research and development activities; contrary to static efficiencies, then, they display their effects generally over time."[19]

1.1 Who is the consumer under the consumer welfare test?

Whose welfare should be the objective for competition agencies? There are several definitions of consumer at the EU level. Each legislation has its own approach. However, at the core of all the definitions –a consumer is a natural person, who is acting outside the scope of an economic

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[17] Miguel de la Mano, –For the Customer's Sake: The Competitive Effects of Efficiencies in European Merger Control", (2002) Enterprise Papers No 11.

[18] R. M. Solow, –Technical Change and the Aggregate Production Function" (1957) 39(3) Rev of Economics and Statistics 312–320; GM Grossman and E Helpman, –Endogenous Innovation in the Theory of Growth"(1994) 8(1) Journal of Economic Perspectives 23–44; DB Audretsch, WJ Baumol and AE Burke, –Competition Policy in Dynamic Markets", (2001) 19(5) International Journal of Industrial Organization 613–634.

[19] Kathuria (n 16)

activity (trade, business, craft, liberal profession)."[20] Thus, consumer is a natural person who engages in a transaction in the municipal boundaries of a state or country.

The merger guidelines in the EU, the UK and the US adhere to the consumer welfare standard.[21]These guidelines agree to take into account innovation, provided that benefits pass on to consumers.[22] The national competition bodies take into account the consumer welfare of the people residing in that particular territory. For example, the text of Article 101 TFEU states "The following shall be prohibited as incompatible with the *common market*…which may affect trade between *Member States* which have as their object or effect the prevention, restriction or distortion of competition within the *common market*..." (Italics added). Consumer welfare, which is the

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[20] The notion of 'consumer' in EU law, Library of the European Parliament (2013) < http://www.europarl.europa.eu/RegData/ bibliotheque/ briefing/2013/130477/LDM_BRI(2013)130477_REV1_EN.pdf> (accessed 18 February 2016); see also, Directive 2011/83/EU of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council, Article 2; So far as the natural person criterion is concerned, the ECJ has categorically stated that community law should not give it a wider interpretation, see ECJ judgment of 22 November 2001, joined cases C-541/99 and C-542/99 - *Cape Snc v IdealserviceSrl and Idealservice MN RE Sas v OMAI Srl* [2001], ECR I-9049, para 16.

[21] See in general Gregory J. Werden, Consumer Welfare and Competition Policy, in Josef Drexl, Wolfgang Kerber and Rupprecht Podszun (eds.) *Competition Policy and the Economic Approach: Foundations and Limitations* (Edward Elgar, 2011) 20.

[22] ibid, p18, Werden argues that the consumer welfare standard may account for innovation: "The consumers' surplus test, however, can account for longer-term and non-price effects. A merger leading to higher prices in the short term could enhance 'consumer welfare' by speeding the introduction of a new product".

stated objective of the EU competition law, is therefore measured at the level of the EU common market.

On the other side of the Atlantic as well, the US Supreme Court prohibits the application of the Sherman Act –where the plaintiff's claim rests solely on the independent foreign harm".[23] This means the Sherman Act cannot be pressed when there is no harm to the US consumers. Similarly, the competition statutes of other jurisdictions as well take into account the consumer welfare of their own people. In this respect the extraterritoriality doctrine too is a tool to check harm to consumer welfare in a specific jurisdiction, resulting from practices that arise elsewhere.[24] The focus on municipal consumer under antitrust laws is regardless of the distinction between intermediate consumer (customers) and final consumers.[25] Therefore, the concept of consumer welfare is jurisdiction specific.

Mainstream economics shows that innovation is a key factor for economic development; thus, it should be the policy focus. However, so far as the consumer welfare standard in competition law is concerned, any gains from dynamic efficiency are required to increase the welfare of municipal consumers who reside within the territorial boundaries of that jurisdiction. Consequently, faced with a

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[23] F. Hoffman-La Roche Ltd. V. Empagran S.A., 524 U.S. 155 (2004).

[24] The US follows the effect doctrine' to prohibit the conduct that arises in another jurisdiction but has a direct, substantial and reasonably foreseeable effect in the US. See, Alison Jones and Brenda Sufrin, *EU Competition Law* (Oxford, fifth edition) 1259-71; The EU relies on single economic doctrine and implementation doctrine. See, Damien Geradin, Marc Reysen and David Henry, Extraterritoriality, Comity and Cooperation in EC Competition Law, in Andrew T. Guzman (ed.) *Cooperation, Comity and Competition Policy* (Oxford University Press, 2010) 21-44.

[25] The General Court in GlaxoSmithKline case had distinguished between intermediate and final consumer, Case T-168/01, *GlaxoSmithKline Services Unlimited v. Commission* [2006] ECR II-2969, para118.

tradeoff between the short run and the long run consumer welfare, an antitrust agency in an emerging market will choose the latter, if the defendant firm, local or multinational, could show a net benefit arising out of the possible innovation to the local consumers.

1.2 The meaning and microeconomics of innovation

Before an argument in favor of incentivizing innovation is made, it is crucial to understand what innovation is. More important, however, is to know how innovation occurs. Schumpeter had suggested five different types of innovation– (i) the introduction of a new good or a new quality of a good (product innovation); (ii) the introduction of a new method of production, including a new way of handling a commodity commercially (process innovation); (iii) the opening of a new market (market innovation); (iv) the conquest of a new source of supply of raw material or intermediate input (input innovation); and (v) the carrying out of a new organization of industry (organizational innovation).[26] Aside these, there can be social innovation as well. This paper, however, just focuses on technological product and process (TPP) innovation. The OSLO manual defines TPP as:

A technological product innovation is the implementation/ commercialisation of a product with improved performance characteristics such as to deliver objectively new or improved services to the consumer. A technological process innovation is the implementation/adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, human resources, working methods or a combination of these.[27]

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[26] Joseph A. Schumpeter, The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle (Harvard University Press, Cambridge, MA, 1934) 66.

[27] ©OECD (2005), Oslo Manual (3rd edition) 9.

Generally, product innovation pushes the demand curve out by increasing a consumer's willingness-to-pay (WTP)[28] (Figure 2); whereas, process innovation reduces the price by pushing the supply curve out (Figure 3). In some cases, however, process innovation may also push the demand curve out. For example, e-commerce has made shopping easier and more lucrative. Process innovation may give a firm cost advantage over its rivals by reducing the price of a product.[29]

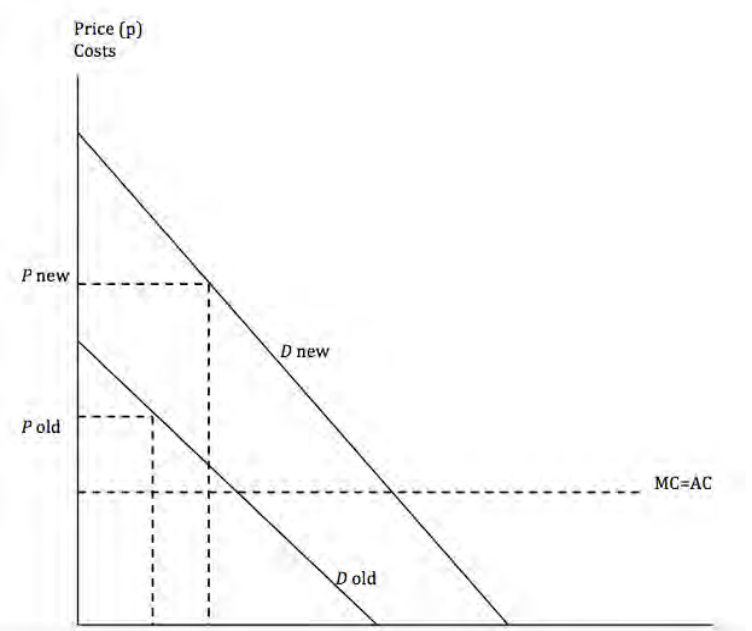

Figure 2: A product innovation represented by a shift in the existing demand curve. Source (Christine Greenhalgh and Mark Rogers, *Innovation, Intellectual property, and Economic Growth* (Princeton University Press, 2010) p 14)

[28] See the discussion in G.M. Peter Swann, *The Economics of Innovation: An Introduction* (Edward Elgar, Cheltenham, 2009) 50-54.

[29] Oslo Manual (n 27) 16.

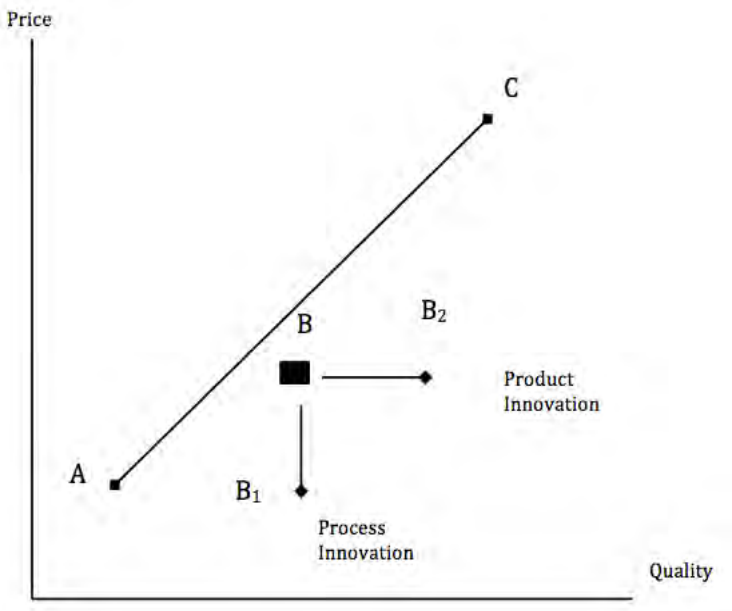

Figure 3: Comparison between product and process innovation (Source: G.M. Peter Swann, *The Economics of Innovation: An Introduction* (Edward Elgar, Cheltenham, 2009) 53) A cost-saving process innovation relocates B to B_1,bringing the price close to inferior product A while the quality remains the same. A product innovation with no additional costs shifts B to B_2, bringing the quality closer to a superior product C while the price remains the same.

Earlier it was the prevailing view that product and process innovation happen in succession.[30] However, several scholars have shown that innovation is not a linear phenomenon, and product and process innovation take

[30] William J. Abernathy, *The productivity dilemma: Roadblock to Innovation in the Automobile Industry* (Baltimore: The Johns Hopkins University Press, 1978); James M. Utterback and William J. Abernathy, ―A Dynamic Model of Process and Product Innovation" (1975) 3(6) Omega 639-56; See also, M.E. Porter, The technological dimension of competitive strategy in Richard S. Rosenbloom (ed.) *Research on Technological Innovation, Management and Policy*, Vol 1. (JAI Press Inc., 1983) 1–33.

place simultaneously.[31] The ―chain-link model" developed by Kline and Rosenberg stresses the importance of marketing and invention/design stages for innovation.[32] Nowadays it is almost the unanimous view that there does not exist a linear relationship between R&D investment and innovation. In fact, a complex system of factors shapes innovation at the firm level and may involve a series of scientific, technological, organizational, financial and commercial activities– this, is referred to as ―innovation dynamo".[33]

1.3. Systems of innovation

As innovation (more broadly dynamic efficiency) increases the long run consumer welfare by pushing the supply and/or demand curve out, the question arises how to achieve this result. Innovation is a complex process that requires a whole eco-system. On a national level the eco-system that consists of interrelated sub-system/actors is popularly known as the National Innovation System (NIS). Beginning with Freeman[34], several scholars from the Neo-Shumpetarian[35] tradition such as Lundval[36] and

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[31] See for example, Christine Greenhalgh and Mark Rogers, *Innovation, Intellectual property, and Economic Growth* (Princeton University Press, 2010) 7. The authors note, ―It is also vital to understand that there is a feedback between the various stages: innovation is rarely a linear progression…There is also feedback between diffusion and innovation stages."

[32] S.J. Kline and N. Rosenberg, An Overview of Innovation, in R. Landau and N. Rosenberg (eds.) *The Positive Sum Strategy: Harnessing Technology for Economic Growth* (National Academy Press, Washington, DC, 1986) 275-306.

[33] Oslo Manual (n 27) 31.

[34] C. Freeman, Technology Policy and Economic Performance: Lessons from Japan (Pinter: London, 1987).

[35] See in general, Horst Hanusch and Andreas Pyka,―Principles of Neo-Schumpeterian Economics" (2007) 31 Cambridge Journal of Economics 275–289.

[36] Bengt-ÅkeLundvall, National Innovation Systems: Towards a Theory of Innovation and Interactive Learning (Pinter, London, 1992).

Nelson[37] attempted to explain and define NIS. The common ground in all the definitions is that the interaction between public and private institutions, which constitute the NIS, leads to innovation.[38]

NIS serves as a conceptual framework to analyze technological changes in a particular country. The institutions[39] forming the NIS may be private and public firms (either large or small), universities, government agencies, and government policies with the aim to produce science and technology (S&T) within national borders.[40]Greenhalgh and Rogers note that R&D is central to innovation, and may happen at any or all of these institutions.[41] The authors also show that the percentage of R&D taken up by these institutions may vary across

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[37] Richard R. Nelson, *National Innovation Systems: A Comparative Analysis* (Oxford University Press, 1993).

[38] For a review of the literature on NIS see Luc Soete, Bart Verspagen and Bas terWeel, ―Systems of Innovation" UNU–MERIT,2009-062<http://www.merit.unu.edu/publications/working-papers/abstract/?id=3863> (accessed 19 February 2016) ; See also, © OECD (1997), ―National Innovation System"< http://www.oecd.org/science/inno/2101733.pdf> (accessed 19 February 2016).

[39] Edquist defines Institutions as ―set of common habits, routines, established practices, rules or laws that regulate the relations and interactions between individuals, groups and organisations. They are the rules of the games". See Charles Edquist, ―The Systems of Innovation Approach and Innovation Policy: An account of the state of the art", Lead paper presented at the DRUID Conference, Aalborg, June 12-15, 2001, under theme F: ‗National Systems of Innovation, Institutions and Public Policies'.

[40] PatarapongIntarakumnerd, Pun-arjChairatana and Tipawan Tangchitpiboon, ―National Innovation System in Less Successful Developing Countries: the Case of Thailand" Research Policy 31 (2002) 1445–1457; Akira Goto, ―Japan's National Innovation System: Current Status and Problems" (2000) 16(2) Oxford Review of Economic Policy 103-13; See also, LoetLeydesdorff and Martin Meyer, ―Triple Helix Indicators of Knowledge-based Innovation Systems: Introduction to Special Issue" (2006) 35(10) Research Policy 1441-49.

[41] Greenhalgh and Rogers (n 31) 89-90.

countries. Thus, while assessing the potential of emerging markets to take up innovation, a scrutiny of all the relevant institutions and actors forming the NIS is important.

In addition to the actors and institutions forming part of NIS, every sector has different set of actors, networks and institutions that characterize innovation in that particular sector. As a result, a separate conceptual framework was devised to understand different trajectories of innovation in different sector. This framework is known as Sectoral System of Innovation (SSI).[42]

[A] sectoral system of innovation and production is a set of new and established products for specific uses and the set of agents carrying out market and non-market interactions for the creation, production and sale of those products. Sectoral systems have a knowledge base, technologies, inputs and demand. The agents are individuals and organizations at various levels of aggregation, with specific learning processes, competencies, organizational structure, beliefs, objectives and behaviors.[43]

The concept of SSI complements the concept of NIS in understanding the trajectory of innovation.[44] However, at the same time since learning and knowledge are specific to a sector, the SSI concept is better geared at explaining innovation specific to sectors. For instance, the strong link between universities and firms existing in the pharmaceutical sector may not be present in the Information and Communication Technology (ICT) sector.[45] Moreover, some sectors may be more innovative as compared to others.[46]

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42 Franco Malerba, ―Sectoral Systems of Innovation and Production" (2002) 31 Research Policy 247–264.

43 ibid

44 ibid

45 For the links between universities and pharmaceutical firms see, F.M. Sherer, Pharmaceutical Innovation, in Bronwyn H. Hall and Nathan Rosenberg (eds.) *Handbook of the Economics of Innovation* (Elsevier, 2010) 540-74.

46 See footnote 9.

Against this backdrop, the actors and institutions in the pharmaceutical sectors are specific and are referred to as Pharmaceutical Innovation System (PIS). This paper does not, however, look into the PIS in India and Brazil to trace the causality between institutions and innovation. Instead, it looks at the outcome of the respective PIS i.e., the level of innovation, as measured by ―international patents", and then uses the results in suggesting suitable competition law application.

2. Level of innovation in the Brazilian and the Indian pharmaceutical sector

To measure the innovative strength in the Brazilian and the Indian pharmaceutical sector, this paper relies on ―international patents". Patent statistics are very often relied upon as a measure of innovation. However, relying on patents as a measure of innovation has drawbacks too: not all patents result in innovation. Also, not all innovations are patented. Further, the economic value of patents may differ substantially.[47] However, despite the drawbacks Furman and Hayes regard ―international patents"[48] as ―the most useful measure available for comparing innovative output across countries and over time."[49] Following the same approach, this paper uses

[47] See, Sadao Nagaoka, Kazuyuki Motohashi and Akira Goto, Patent Statistics as an Innovation Indicator, in Bronwyn H. Hall and Nathan Rosenberg (eds.) *Handbook of the Economics of Innovation* (Elsevier, 2010) 1083–1127; see also, © OECD, ―The Measurement of Scientific and Technological Activities Using Patent Data as Science and Technology Indicators Patent manual 1994, OCDE/GD(94)114.

[48] ―International patents are defined as those patents which are granted by the USPTO to a non-US inventor (or in the case of the US, by a major foreign patent granting agency)." See, J.L. Furman, M.E. Porter and S. Stern, ―The Determinants of National Innovative Capacity" (2002) 31Research Policy 899–933.

[49] J.L. Furman and R. Hayes, ―Catching Up or Standing Still? National Innovative Productivity Among ‗follower' Countries" (2004) 33 Research Policy 1329-1354; see also Furman et al (2002) (n 48).

–international patents" granted by the United States Patent and Trade Mark Office (USPTO) to the Indian and Brazilian pharmaceutical firms from 1999 to 2014 as the indicator of innovative strength in the pharmaceutical sector.[50]

Fagerberg et al. have criticized relying solely on patents for measuring country's innovation system.[51] They argue that patents are used much more intensively in some industries than others. Also, minor innovation/adaptations will not be taken into account in view of global novelty requirement. Further, since the domestic IP system may not function very well in developing countries, inventors in these countries may not use patents frequently. For these reasons, they note that most of the innovative activities in countries below the technology frontier and developing countries would get unrecognized by this approach. However, pharmaceutical sector is a peculiar one– patents are used much more intensively in this sector, because while the cost to innovate a new drug is enormous, it takes very little investment to copy a drug. For this reason patent propensity in this sector is very high.[52] Further, relying on –international patents" as opposed to domestic patents

[50] This approach is consistent with Furman & Hayes (2004) (n 49), who also used patents granted by USPTO as a measure of national innovative output. Some other researchers as well have used patent data as a proxy of national innovative capacity. See, A Hidalgo, G Penas, I Belda, A Alonso and D Marquina, –The Use of Patents to Assess National Innovation Systems: Evidences from Spanish Biotechnology"(2014) 2(4) Intellectual Properties Rights. Intel Prop Rights <http://www.esciencecentral.org/journals/the-use-of-patents-to-assess-national-innovation-systems-evidences-from-spanish-biotechnology-ipr.1000122.php?aid=29840> (accessed 18 February 2016).

[51] Fagerberg et al. (n 6)

[52] Arundel and Kabla found patent propensity for product innovation very high (79.2%) for European firms. Anthony Arundel and Isabelle Kabla, –What Percentage of Innovations are Patented? Empirical Estimates for European Firms" (1998) 27(2) Research Policy 127-141.

provides a uniform benchmark against which two different jurisdictions can be compared, based on new-to-the-world innovations.

At the time of India's independence in 1947, Western Multinational Corporations (MNCs) held about 80% of the Indian market and drug prices were among the highest in the world.[53] Brazil had a comparatively better position with 47.1% of the market dominated by MNCs. Subsequently, by 1970, the share of MNCs increased to 77.7% in Brazil.[54]

The year 1970 marked a watershed event in the Indian pharmaceutical sector, as India started granting only process patent. Around the same time (1969) Brazil also started granting only process patent. In contrast with Brazil, the share of MNCs in the Indian pharmaceutical sector fell from 68% in 1970 to 50% by 1980.[55] Subsequently, in compliance with the TRIPS agreement both Brazil (since 1997) and India (since 2005) started granting product patents as well.

Salient features of the catching-up process	**India**	**Brazil**
Size of pharmaceutical market in terms of local sales in 2005	10.8$ billion	5.3$ billion
Trade balance in pharmaceuticals in 2005	3.8$ billion	−2.7$ billion
Internationalization	Mergers and acquisitions abroad; manufacturing units abroad	Underdeveloped

[53] Samira Guennif and Shyama V. Ramani, ―Explaining Divergence in Catching-up in Pharma Between India and Brazil using the NSI framework"(2012) 41Research Policy 430–441.

[54] ibid

[55] ibid

Exports	Formulations and bulk drugs to both developed and developing countries	Underdeveloped
MNC dominance in 2005-2006	Less than 20% in 2005–2006, but over 40% in 2011 with mergers and acquisitions	70% of the market held by foreign firms

Figure 4: A snapshot of the present state of affairs in the Indian and Brazilian pharmaceutical industry. (Source: Adapted from Samira Guennif and Shyama V. Ramani, ―Explaining divergence in catching-up in pharma between India and Brazil using the NSI framework" (2012) 41Research Policy 430–441)

As has been seen above, the Systems of Innovation approach provides a useful framework to answer why different countries had different trajectories in accumulation of industrial capabilities. Guennif and Ramani in their paper, using the NIS framework, draw a comprehensive comparison between the Indian and the Brazilian pharmaceutical sector.[56] The authors note ―*as a result of their divergent capabilities accumulation, today Indian firms produce most generics, making the corresponding API [Active Pharmaceutical Ingredient] by themselves; while Brazilian firms have to count on imported API to formulate the drugs.*"[57] On the basis of their analysis they hold that ―*the primary objective of Indian firms is to accumulate innovation capabilities, whereas Brazilian firms need to expand their production capabilities to include API, while accumulating new drug discovery capabilities*."[58]

Based on the number of patents granted by the USPTO, the following graph shows that the innovative capabilities of

[56] ibid
[57] ibid
[58] ibid

the Brazilian pharmaceutical industry substantially lag behind its Indian counterpart.

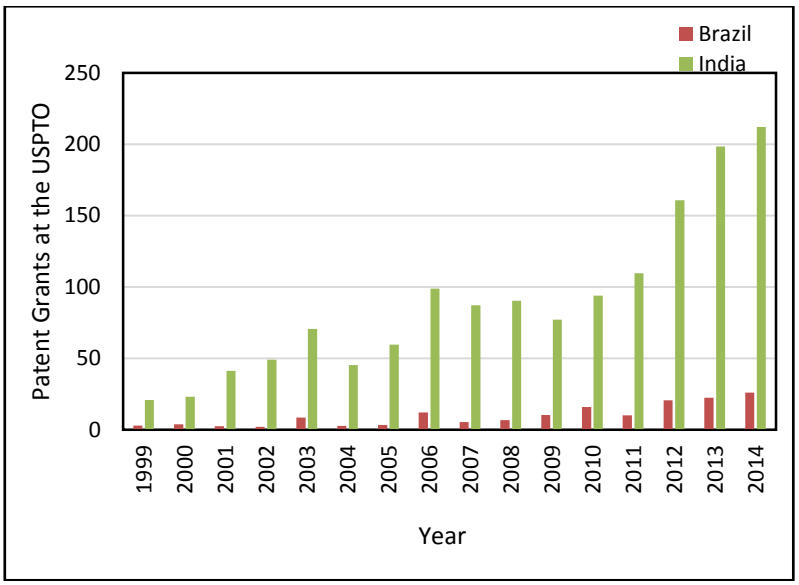

Figure 5: Comparison between the innovative capabilities of the Brazilian and Indian pharmaceutical firms (Source: Author's elaboration, based on the OECD data.[59])

The above figure leads to the inference that the Pharmaceutical Innovation System (PIS) in India is stronger than its Brazilian counterpart, engendering more innovative drugs.

[59] © OECD.Stat <https://stats.oecd.org/Index.aspx?DataSetCode= PATS _IPC> (accessed 19 February 2016)

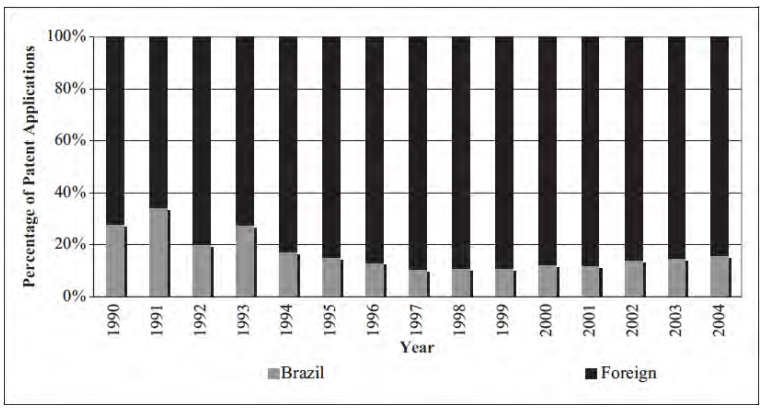

Figure 6: Pharmaceutical patent application in Brazil (Shares): Based on the percentage of patent applications filed, this graph shows that Brazilian firms have not shown signs of increasing innovative capacity vis-à-vis foreign firms. (Source: Kenneth C. Shadlen, ‗The Political Contradictions of Incremental Innovation: Lessons from Pharmaceutical Patent Examination in Brazil' (2011) 39(2) Politics & Society 143–174)

There are other researchers as well who support the claim about India's increasing innovative capability in the pharmaceutical sector. Angeli shows that post-TRIPS Indian pharmaceutical firms have become more innovative based upon an increased number of patents filed, and higher R&D investment. She notes that this phenomenon ―highlights that crossborder alliances may have been crucial in providing the necessary financial resources, scientific knowledge and managerial and procedural expertise to do so."[60] Mahajan corroborates this finding.[61] He shows that ever since 2005, when India started granting product patent as well, Indian firms have been actively participating in the development of New Chemical Entity

[60] Federica Angeli, ―With the Help of a Foreign Ally: Biopharmaceutical Innovation in India After TRIPS" (2014) 29(3) Health Policy and Planning 280-91.

[61] M. M. Mahajan, ―The Emergence of New R&D Paradigms in the Indian Pharmaceutical Industry: Post TRIPS Period" (2011) 16 Journal of Intellectual Property Rights 321–329.

(NCE), which is an advanced level capability in research. It is quite remarkable that the Indian pharmaceutical firms have the highest number of Drug Master File (DMF) amongst all key competing economies.[62]

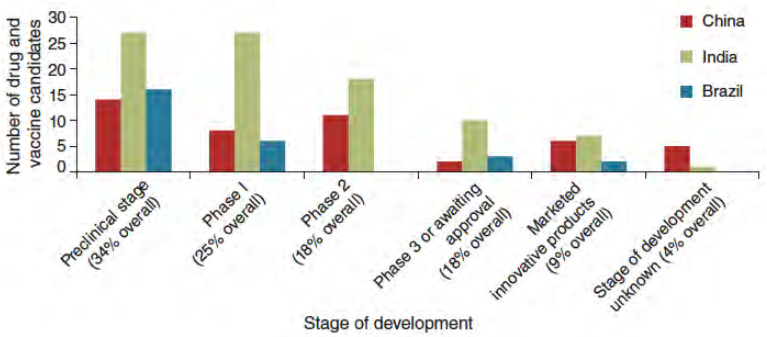

Figure 7: Total number (and percentage) of innovative drug and vaccine candidates within indigenous companies in China, India and Brazil grouped by stage of development shows a stark difference between India and Brazil. (Source: Rahim Rezaie, Anita M McGahan, Abdallah S Daar and Peter A Singer, "Innovative drugs and vaccines in China, India and Brazil" (2012) 30(10) Nature Biotechnology 923-26.)

Morel et al. recognize that all developing countries can take up health innovation. However, there are some developing countries that are more scientifically advanced than others. They refer to those countries as Innovative

[62] ibid. "A Drug Master File (DMF) is a submission to the Food and Drug Administration (FDA) that may be used to provide confidential detailed information about facilities, processes, or articles used in the manufacturing, processing, packaging, and storing of one or more human drugs." See, Drug Master Files: Guidelines, U.S. Food and Drug Administration <http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm122886.htm>(accessed 12 October 2016).

Developing Countries (IDC).[63] Several researchers have noted that the Indian pharmaceutical industry has recently been showing signs of from ‗imitation to innovation'.[64] In contrast with India, Brazilian pharmaceutical sector has not shown such signs of increased innovative capability, as evident from the above discussion. Moreover, the Indian PIS is strongly integrated to the global markets, whereas the Brazilian PIS is largely driven by domestic demand.[65]

To sum up, it can be said that the Indian pharmaceutical industry has come a long way since the time when only process patents were granted. At that time the policy focus was to reduce prices by facilitating easy entry of local generic firms– short-term consumer welfare. However, now the India pharmaceutical is increasingly turning to innovation. [66]Thus, to a certain extent, the policy aim in India could be to pursue the longrun consumer welfare. To this end, law should play a constructive role towards

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[63] C.M. Morel et al., ―Health Innovation Networks to Help Developing Countries Address Neglected Diseases," Science 309, no. 5733 (July 2005): 401–404.

[64] Joanna Chataway, Joyce Tait and David Wield ―Frameworks for Pharmaceutical Innovation in Developing Countries—The Case of Indian Pharma"(2007) 19(5) Technology Analysis & Strategic Management 697-708; see also, Dinar Kale and Steve Little, ―From Imitation to Innovation: The Evolution of R&D Capabilities and Learning Processes in the Indian Pharmaceutical Industry", (2007) 19(5) Technology Analysis & Strategic Management 589-609.

[65] Verena Sch ren, ―What a Difference a State Makes: Pharmaceutical Innovation After the TRIPs Agreement", (2013) 15 (2) Business and Politics 217–243.

[66] Some researchers attribute the transition from ‗imitation to innovation' to India's acceptance of the product patents as per the TRIPS agreement in the year 2005. See, Dominique Bouet, ―A Study of Intellectual Property Protection Policies and Innovation in the Indian Pharmaceutical Industry and Beyond" (2015) 38 Technovation 31-41; NeenaBedi, P.M.S. Bedi and Balwinder S. Sooch, ―Patenting and R&D in Indian Pharmaceutical Industry: Post TRIPS Scenario" (2013) 18 Journal of Intellectual Property Rights 105-110.

innovation. On the other hand, the Brazilian pharmaceutical sector has not reached this stage. Consequently, *prima facie*, the policy aim in Brazil should be to pursue the shortrun consumer welfare. The following section will illustrate this point by discussing compulsory licenses under competition law.

3. Implication for competition law: a case of compulsory licenses in the pharmaceutical sector

This part of the paper builds upon the previous two sections and argues for customizing the application of competition law, as per the innovative capability of the pharmaceutical sector in Brazil and India. As has been seen in the previous section, the Brazilian pharmaceutical firms are not as innovative as their Indian counterparts. This part argues for factoring this reality in the application of competition law so far as compulsory licensing is concerned.

Aside IP rights, competition law as well has bearing on innovation.[67] The use of competition law to grant compulsory IP licenses has been hugely debated. The principal argument against compulsory licensing is that it has a chilling effect on innovation.[68] In principle, in such cases it is crucial to balance short-term benefits of granting access against long-term goals of investment and innovation. However, even before this exercise is carried out, the competition agencies in developing countries need to be sure that the Agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS) places no

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[67] See, © OECD (2006), "Competition, Patents and Innovation", DAF/COMP(2007)40.

[68] It is the general perception that compelling the patent-holder to license her product reduces her incentive to innovate. However, there is empirical evidence to counter this perception. See, Colleen Chien, "Cheap Drugs at What Price to Innovation: Does the Compulsory Licensing of Pharmaceuticals Hurt Innovation?" (2003) 18 Berkeley Technology Law Journal 853.

restrictions on granting compulsory license under the competition law of the Member state.

3.1.The legality of compulsory license under competition law as per the TRIPS agreement

The TRIPS agreement provides a legal framework that allows competition agencies to issue compulsory licenses. This framework is present in the following articles.

Art. 8(2) of the TRIPS states that: "Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent *the abuse of intellectual property rights* by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology."(Italics added) The term 'abuse' as mentioned in Art 8(2) TRIPS is specific to a jurisdiction. What may be an abuse in developing countries may not be an abuse in a developed country.[69]

Article 31(b) of the TRIPS agreement authorizes the Members to issue compulsory license "to remedy a practice determined after judicial or administrative process to be anti-competitive."[70]

Article 40 (2) states that "Nothing in this Agreement shall prevent Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an *abuse of intellectual property rights*

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[69] Cottier also holds that the Member States to the TRIPS agreement should apply a competition law that suits their domestic conditions. He notes "[m]embers of the WTO shape principles and rules in accordance with varying socioeconomic needs." Thomas Cottier, The Doha Waiver and its Effects on the Nature of the TRIPS System and on Competition Law – the Impact of Human Rights, in IngeGovaere, HannsUllrich (eds.) *Intellectual Property, Public Policy and International Trade* (Peter Lang, Brussels, 2007) 173-99.

[70] In fact, Section 90 (1) (ix) of the Indian Patent Act has a provision corresponding to Art 31 (b) of the TRIPS.

having an adverse effect on competition in the relevant market." (Italics added)

Thus, the only pre-condition this framework attaches is the requirement that the impugned practice has to be held anti-competitive after judicial or administrative process. This was further confirmed by the agreement reached between the US and Argentina under the aegis of the WTO, after the former questioned the provisions of the Argentine patent law No. 24.481 that had the provision on compulsory license to remedy anti-competitive practices.[71] Further, the Court of First Instance (CFI, now renamed as the General Court) in its *Microsoft* ruling asserted in clear terms that abuse of intellectual property rights could be checked by the competition authorities of the Member states in accordance with the power granted under the TRIPS agreement.[72]

Aside the theoretical possibility, there have been actual cases as well where the competition agency did not shy away from issuing compulsory license. For instance, the Italian Competition Authority (ICA) issued its first compulsory license when a multinational company Merck refused to license imipenem/cilastatina (an active ingredient) to Dobfar, an Italian undertaking.[73]

The Italian Competition Authority once again relied on essential facility doctrine in the Bayer[74] case. However, in

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[71] WTO documents WT/DS171/3, WT/DS196/4, IP/D/18/Add.1, IP/D/22/Add.1.20 June, 2002

[72] Case T-201/04, *Microsoft Corp. v. Commission*, 2007 E.C.R. II-3601 (Ct. First Instance) paras 798, 801 and 1189.

[73] ICA decision on 15 June 2005, A364 Merck—PrincipiAttivi in Boll. 23/2005

[74] Decision of the IAA of 28 June 2011, Case A415—Sapec Agro/Bayer-Helm, Bulletin No. 26/2011, p. 5. See also, Gianni De Stefano, "Tough Enforcement of Unilateral Conduct at the National Level: Italian Antitrust Authority Sanctions Bayer and Pfizer for Abuse of Dominant Position (aka AstraZeneca Ruling and Essential Facility Doctrine in Italian Sauce)" (2012) 3(4) Journal of European Competition Law & Practice 396-403.

this case no compulsory license was issued, only penalty was imposed. Both the Merck and Bayer case have been criticized on substantive grounds.[75] However, no action was brought against the Italian government for violating the TRIPS agreement.

Scholars as well have argued that competition law can be successfully used in order to correct the anomalies (the social cost of exclusion) created by the IPR system.[76]Some others have gone to the extent of lamenting that developing countries have not successfully used competition policy, as provided within the framework of the TRIPS agreement, to ensure distributional needs.[77]

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[75] See, Pablo Ibanez Colomo, ―Article 82 EC as a ―built-in" remedy in the system of Intellectual Property: the example of supplementary protection for pharmaceuticals in Italy", in Inge Govaere and Hanns Ullrich (eds.) *Intellectual Property, Market Power and the Public Interest* (Peter Lang, 2008) 119-142. Colomo argues that ―[t]he mechanism put in place by Law No. 112/02 most likely intended to achieve industrial policy objectives, in that generic manufacturers, and not consumers, were the companies truly benefiting from the measure."

[76] See, Josef Drexl, ―The Critical Role of Competition Law in Preserving Public Goods in Conflict with Intellectual Property Rights" In K. Maskus and J. H. Reichman (eds.), *International Public Goods and Transfer of Technology Under a Globalized Intellectual Property Regime* (Cambridge Univ. Press, 2005) 709-725; Jerome H. Reichman and Catherine Hasenzahl, ―Non-voluntary Licensing of Patented Inventions Historical Perspective, Legal Framework under TRIPS, and an Overview of the Practice in Canada and the USA", (June 2003) UNCTAD-ICTSD Project on IPRs and Sustainable Development <http://www.ictsd.org/ downloads/2008/06/cs_reichman_hasenzahl.pdf> (accessed 18 February 2016); HannsUllrich, ―Expansionist intellectual property protection and reductionist competition rules: A TRIPS perspective"(2004) 7(2) Journal of International Economic Law 401-430.

[77] Cottier (n 69); Jonathan Berger ―Advancing Public Health by Other Means: Using Competition Policy" in P Roffe, G Tansey and D Vivas-Eugui (eds.) *Negotiating health: intellectual property and access to medicines* (Earthscan, London, 2006) 181-203.

3.2. Abuse of dominance and compulsory licensing

The concept of abuse by a dominant undertaking in competition law has given rise to several controversies.[78] Broadly speaking, an abuse may engender exclusionary or exploitative effects.[79] Compulsory license can be issued under competition law for two different abuses. First is the case when a dominant pharmaceutical firm refuses to supply/share its patented Active Pharmaceutical Ingredient (API) to generic firms. This action falls under the category of exclusionary practices. In the second type of case, a dominant patentee firm may charge excessive prices for its pharmaceutical product. Such abuse is an example of exploitative conduct.

There have been precedents with respect to issuing compulsory licenses in both exclusionary and exploitative cases. So far as the former is concerned, the above example of Italy issuing compulsory license in the Merck, and the Bayer case is illustrative. In the EU, the case law accepts that ―eharging a price which is excessive because it has no reasonable relation to the economic value of the product supplied is . . . an abuse."[80] So far EU has not granted compulsory license because of excessive prices. However, there are other jurisdictions that considered excessive pricing as abuse and issued compulsory license to remedy it. The *Hazel Tau* case[81] in South Africa demonstrates that competition law can be successfully employed in case of excessive pricing by the right-holder pharmaceutical company. In this case South

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78 See in general, Pinar Akman, The Concept of Abuse in EU Competition Law: Law and Economic Approaches (Hart Publishing, 2012).

79 Art 82 Guidance (n 14) para 1 and para 7.

80 Case 27/76 *United Brands v Commission* [1978] ECR 207 at [250].

81 Hazel Tau et al. v. GlaxoSmithKline, Boehringer Ingelheim, et al. & Aids Healthcare Foundation et al v. GlaxoSmithKline, Boehringer Ingelheim, et al. Case Numbers: 2002sep226 & 2002jan357.

Africa's Competition Commission found that the defendants, GlaxoSmithKilne (GSK) and Boehringer Ingelheim (BI), had abused their dominant position by denying a competitor access to an essential facility, charging excessive prices, and engaging in exclusionary activities in the market for Anti-Retroviral (ARV) drugs. The South African Competition Commission recommended a compulsory license as a measure of penalty. Later, the Competition Commission entered into a settlement agreement with the defendant firms, whereby the latter agreed to issue several voluntary licenses.[82] While this agreement provided a speedy remedy to the complainants, it took away the opportunity from the appellate tribunal to set out the jurisprudence on such matters. A very interesting lesson from this case is that civil society organizations can take the lead to use competition law against the dominant originator multinational companies, in case the government shows reluctance in view of the political or diplomatic pressure.[83]

3.3. The primary argument against compulsory licensing–Intervention adversely affects investment and innovation

So far as incentivizing innovation is concerned, the analysis presented in Section 2, by comparing the Brazilian and the Indian pharmaceutical sector, showed that the PIS of some countries may be underdeveloped. Such countries may not have the requisite conditions to push the supply and/or the demand curve out. Thus, the short run welfare becomes more important than the long run gains. Therefore, the choice between the long run and the short run consumer welfare depends on the strength of the innovation capability in a particular sector. For example, as

[82] See the competition commission settlement agreement <http://www.tac.org.za/newsletter/2003/ns10_12_2003.htm> (accessed 19 February 2016)

[83] Berger (n 77)

shown in part two of this paper, Brazilian PIS is weak and the firms are still in the phase of imitating foreign technology. Consequently, competition law can aim for the short run gains by way of compulsory licensing in the Brazilian pharmaceutical sector. On the other hand, Indian PIS looks vibrant, with several innovative firms. Therefore, the role of law should be to support innovation. Consequently, compulsory licensing is not the correct strategy in the Indian pharmaceutical sector.

Law is only one of the institutions and actors constituting PIS. One nuanced observation about patents is that ―patents magnify the incentives to innovate, but do not create them, in the absence of the competencies that make innovation possible in the first place."[84] For instance, strong patent protection did not lead to innovation in the Italian pharmaceutical industry.[85] Furthermore, the link between strong patents and innovation, in general, is highly debatable.[86] One strand of research shows that strong IP rights foster innovation only in those countries that have ―initial above-average level of development and complexity".[87] This observation about patents is true for

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[84] Maureen McKelvey, Orsenigo and Fabio Pammolli, Pharmaceuticals Analyzed Through the Lens of a Sectoral Innovation System, in Franco Malerba (ed.) *Sectoral Systems of Innovation: Concepts, Issues and Analyses of Six Major Sectors in Europe* (Cambridge University Press, Cambridge, 2004) 80.

[85] F. M. Scherer and S. Weisburst, ―Economic Effects of Strengthening Pharmaceutical Patent Protection in Italy" (1995) 26 (6) International Review of Industrial Property and Copyright Law 1009–1024.

[86] One view is that patents hardly encourage any innovation. For a general review see, ‗A Question of Utility' *The Economist* (August 8th 2015) <http://www.economist.com/node/21660559> (accessed 11 October 2016).

[87] Cassandra Mehlig Sweet and Dalibor Sacha Eterovic Maggio, ―Do Stronger Intellectual Property Rights Increase Innovation?" (2015) 66 World Development 665-677. In fact the authors observe that ―[f]ordeveloping countries, our results show that IPR has at besta non-

competition law as well. In the absence of supporting actors and institutions, reliance on competition law, in itself, to foster innovation will be detrimental to consumer welfare. Consequently, the evolution of law should be in sync with the rest of the institutions forming part of the PIS. The following observation of Reichman about the stimulating effects of IP on innovation in different sectors holds equally good for competition law.

In China, India, and Brazil, moreover, knowledge economy skills and capacities have apparently reached the point where the stimulating effects of IPRs will influence different sectors and stakeholders quite differently, depending on the extent to which they are still driven by imitation-related innovation or investments in basic, or at least relatively original, R&D.[88]

Another argument against strong intellectual property rights in developing countries is that the multinational pharmaceutical companies spend very little amount on research on diseases that are relevant to developing countries. Instead, they choose to spend where there is a large market in developed countries.[89] However, the

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significant effect on economic complexity and most often has a negative effect." While supporting the fundamental premise of this paper, the present research disagrees on the same recommendation made for developing countries in general.; see also, John Hudson and Alexandru Minea, "Innovation, Intellectual Property Rights, and Economic Development: A Unified Empirical Investigation" (2013) 46 World Development 66-78; see also, Yee Kyoung Kim, Keun Lee, Walter G. Park and Kineung Choo, "Appropriate intellectual property protection and economic growth in countries at different levels of development" (2012) 41(2) Research Policy 358-375.

[88] Jerome H. Reichman, "Intellectual Property in the Twenty-first Century: Will the Developing Countries Lead or Follow?"(2009) 46(4) Houston Law Review 1115-1185 at 1124.

[89] Integrating Intellectual Property Rights and Development Policy,Report of the Commission on Intellectual Property Rights, Commission on Intellectual Property Rights (London, 2002) <http://www.iprcommission.org/papers/pdfs/final_report/ciprfullfinal.p

pharmaceutical industry is a peculiar sector. Every API is aimed at treating a particular disorder, and in certain cases even the formulations may be separate markets depending on their substitutability with each other. There are diseases that are specific to emerging markets or tropical areas, such as dengue, malaria and tuberculosis. Some multinational firms are investing in diseases specific to emerging markets.[90] For instance Pfizer Asia Research was established in 2006 to "seed, seek, source, and spark" innovation in Asia using a virtual biotech model across the region with therapeutic focus on emerging market diseases such as liver disease and tuberculosis.[91] In such a case, incentivizing investment would ensure more welfare.

In the absence of legal and economic reasons for not issuing compulsory license under competition law, the only reason for not doing so is the fear that any such intervention will have adverse effect on Foreign Direct Investment (FDI). However, by giving the example of China, Reichman allays this fear. China managed to attract massive FDI despite "woefully inadequate intellectual property protection", as it had a large market; on the other hand some small countries, despite having strong IP regime attracted little FDI, as their market provided less economic opportunities.[92] It cannot be denied that a

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df> (accessed 19 February 2016); for a discussion on this issue see "Macroeconomics and Health: Investing in Health for Economic Development", Commission on Macroeconomics and Health, WHO, (Geneva, 2001) 79 <http://apps.who.int/iris/ bitstream/10665/42435/ 1/924154550X.pdf> (accessed 19 February 2016). As per this report the expenditure on the 'diseases of the poor' (Type II and especially Type III diseases) is between 5 percent of the total R&D.

90 Evolving R&D for emerging markets, *Nature Reviews Drug Discovery* 9, 417-420 (June 2010).

91 ibid

92 Jerome H. Reichman, 'Compulsory Licensing of Patented Pharmaceutical Inventions: Evaluating the Options', (2009) 37(2) The Journal of Law, Medicine & Ethics 247-263 at 256.

country that issues compulsory license on patented pharmaceuticals will face stiff opposition. However, interestingly, if such countries –stand up" for their legal rights, they would find protection under the WTO rules, as compulsory licensing is in complete conformity with the TRIPS agreement.[93]

3.4. Other arguments against compulsory licensing

Even if the above analysis presents a convincing case for issuing compulsory licenses in order to ensure consumer welfare, it cannot be denied that the concerned country may not have the firms that can prepare generics of branded medicines. Most of the emerging economies lack the capacity to manufacture generic copy of the drugs in question, or cannot procure the key active ingredients, thus rendering the grant of compulsory license a vain exercise.[94] In such cases, these countries can benefit from the newly inserted Article 31bis of the TRIPS agreement that allows another country with technological capacity to export the drug to the country issuing compulsory license.[95]

It has also been suggested that instead of issuing compulsory license, competition agency can ask the patent holder to reduce the prices, as such an option is –easier to apply and less controversial than a mandatory obligation".[96] There are practical problems with this

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[93] Ibid at 258. Reichman by giving the example of USTR Section 301 listing of Thailand, states that a country may take recourse to Article 23 of the WTO Dispute Settlement Understanding (DSU), if it believes that the issued compulsory license is in violation of the TRIPS agreement. However, a country cannot unilaterally impose sanctions against a country that issues compulsory license.

[94] ibid

[95] See WTO, –Amendment of the TRIPS Agreement" (Decision of 6 December 2005)<https://www.wto.org/english/tratop_e/trips_e/wtl641_e.htm> (accessed 20 February 2016); see also, Reichman (n 92).

[96] R O' Donoghue and AJ Padilla, The Law and Economics of Article 102 TFEU, (Hart Publishing, Second Edition, 2013) 517.

suggestion. The competition agencies in emerging markets, with their scant resources, cannot watch over the negotiation process. The difficulty to regulate prices, in fact, makes a strong case for structural remedies or similar remedies such as compulsory licenses that could reduce the barrier to entry or re-entry.[97] One commentator, therefore, argues "[u]nfair pricing should be dealt with by attacking the cause of the defendant's market power, of which high prices are a symptom."[98]

3.5. The need to contextualize competition law

The young competition regimes in developing world have a last-mover advantage, in that they can benefit from the rich competition law jurisprudence of more mature jurisdictions such as the EU and the US. On one hand this approach allows developing countries to learn the nuances of competition law enforcement, on the other, a blind imitation can have detrimental effects for consumers and economy. [99] Compulsory licensing in competition law is one such issue where emerging markets need to base their decision on the prevailing economic realities of a sector, as

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[97] ibid 736.

[98] M Siragusa, "Excessive Prices In Energy Markets: Some Unorthodox Thoughts" in C-D Ehlerman and M Marquis (eds.), *European Competition Law Annual 2007: A Reformed Approach to Article 82 EC*, (Hart Publishing, 2007) 643-649.

[99] On the benefits of the competition law transplant from developed to developing countries, see Michal S. Gal and Eleanor M. Fox, "Drafting competition law for developing jurisdictions: learning from experience" (2014) New York University Law and Economics Working Papers. Paper 374< http://lsr.nellco.org/cgi/viewcontent.cgi?article=1378&context=nyu_lewp>(accessed 3 October 2016). The authors note that, "The challenge is to identify those instances in which the unique characteristics lead in a different direction and outweigh the motivation to follow established competition law regimes, and to design rules accordingly."; see also, E. Fox, 'Economic Development, Poverty and Antitrust: The Other Path' (2007) 13 Southwestern Journal of Law 211.

the contemporary EU and the US jurisprudence on compulsory licensing echoes their stage of economic and technological development.

The European Commission has recognized the increasing significance of innovation in its policy documents. In particular, the guidance paper on the application of Article 102 (ex Article 82) asserts that refusal to deal will result in consumer harm when the competitors are prevented from ―bringing innovative goods or services to market and/or where follow-on innovation is likely to be stifled."[100] Thus, in the EU there has been an attempt to align competition law with innovation. The EU case law on refusal to deal has developed ‗exceptional circumstances' test, where the right-holder can be mandated to provide access to its facility.[101] One of the exceptional circumstances is that the refusal prevents the appearance of a new product on the market. The ‗new product' test was first devised in the *Magill* case and further developed in the *IMS* and *Microsoft*[102] cases.

The European Commission applied the ‗incentive balance test' in the *Microsoft* case.[103] As per this test, ―the possible negative impact of an order to supply on …[incumbent's] incentives to innovate is outweighed by its positive impact on the level of innovation of the whole industry". [104] It is submitted that the Commission's ‗incentive balance' test is not suited for developing countries (more importantly those sectors) that do not exhibit any signs of innovation,

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[100] Art 82 Guidance (n 14) para 87

[101] Joined Cases C-241/91 P and C-242/91 P *RTE and ITP v Commission (Magill*) [1995] ECR I-743,para.50*; IMS Health [2004] ECR I-5039*, para.35; *Volvo v. Veng*[1988] ECR 6211, para. 9.

[102] Microsoft COMP/C-3/37.792

[103] On this test, see in general Simonetta Vezzoso, ―The Incentives Balance Test in the EU Microsoft Case: a Pro-innovation ‗Economics-based' Approach" (2006) 27 (7) European Competition Law Review 382-390.

[104] Microsoft COMP/C-3/37.792. para 783.

as possible negative effects on incumbent‘s incentive to innovate will always be higher than the level of innovation of the whole industry.

The US takes a similar approach to compulsory licensing as that of the EU. Even though some lower courts used the term ‗essential facility‘ categorically in their judgments, the US Supreme Court, however, has always refrained from using this terminology. The latest jurisprudence on this concept, evident from the *Trinko*[105] case, indicates the reluctance of the Supreme Court in granting access to plaintiff, as such intervention disincentivizes innovation. The US Supreme Court famously observed that:

The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices – at least for a short period is what attracts 'business acumen' in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct.[106]

The relationship between IP and Competition law is complex, and arguably varies from jurisdiction to jurisdiction. In the EU, the *Microsoft* case on refusal to supply harmonized IP and competition law by ensuring that compulsory license under competition law can be issued only when innovation is at stake. Thus,

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[105] Verizon Communications, Inc v Law Offices of Curtis V Trinko, LLP 540 US 398 (2004).

[106] Ibid. The Supreme Court also observed: ―Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities.‖

competition law and IP have the same objective– innovation.[107] However, as seen in Part II of this paper, some sectors in emerging markets, may not have the innovative capability. Consequently, innovation cannot be the criterion for antitrust intervention in such sectors in emerging markets.

Drexl argues in favor of contextualizing competition law and policy so that it can take into account different cultural, socio-economic and political background of developing countries.[108] He observes that "[n]eoclassical competition economics has a tendency to ignore the general economic context of markets in a given jurisdiction" and adds "[h]ence, contextualization is key for assisting developing jurisdictions to make the most appropriate policy choices in structuring their competition law system".[109]The research presented in this paper has attempted to contextualize competition law not only as per the technological reality of a particular sector in a developing country.

It is accepted that the goals of antitrust are fluid in nature and change according to the stage of economic development.[110] The WIPO development agenda as well recognizes that "[n]orm-setting activities shall take into account different

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[107] See also, Ariel Ezrachi and Mariateresa Maggiolino, "European Competition Law, Compulsory Licensing, and Innovation" (2012) 8(3) Journal of Competition Law & Economics 595–614.

[108] Josef Drexl, Consumer Welfare and Consumer Harm: Adjusting Competition Law and Policies to the Needs of Developing Jurisdictions, in Michal S. Gal et al. (eds.), *The Economic Characteristics of Developing Jurisdictions: Their Implications for Competition Law* (Edward Elgar, 2015) 283.

[109] ibid at 285

[110] American Bar Association, "Report on Antitrust Policy Objectives" (2003) Section of Antitrust Law <http://www.americanbar.org/content/dam/aba/administrative/antitrust_law/report_policyobjectives.authcheckdam.pdf> (accessed 20 February 2016).

levels of development'.[111] Indeed, the balance between IP and antitrust has not been uniform always, even in the most developed jurisdictions. For instance, in the US patent laws made way for competition until 1982, when competition law was applied aggressively against IP.[112] Balancing the positive and negative effects of compulsory license is not an exact science, even with the most sophisticated economic tools.[113] Therefore, in principle, a competition agency has to rely upon probability of benefit or harm arising from the intervention. As shown in Part 2 of this paper, the innovative capability of sectors varies in different emerging markets. Consequently, in case of compulsory license, capacity to innovate should factor in the balance of probabilities exercise. Flowing from the research is the proposition that so far as the balance between IP and anti-trust is concerned, not only does it vary from sector to sector, it also changes through time. The shifting of balance from anti-trust to IP in the US demonstrates this successfully.[114]

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[111] WIPO, "The 45 Adopted Recommendations under the WIPO Development Agenda" (2007) Cluster B, Recommendation No. 15 < http://www.wipo.int/ip-development/en/agenda/ recommendations. html> (accessed 20 February 2016).

[112] Reichman (n 88)

[113] O'Donoghue and Padilla (n 96) 523; To see how the competition agencies have to balance the short run losses against the long run gains, see © OECD, The Role of Efficiency Claims in Antitrust Proceedings 2012 DAF/COMP (2012) 23.

[114] See, Herbert Hovenkamp, The Intellectual Property-Antitrust Interface, in3 Issues in Competition Law and Policy 1979 (ABA Section of Antitrust Law 2008), Chapter 79, Available at SSRN <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1287628> (accessed 20 February 2016) Hovenkamp argues "[e]ver since the antitrust laws were passed, antitrust and IP have had to accommodate one another, but they have done so in different ways in different periods. The early twentieth century was an era of IP expansion and antitrust accommodation. During this period even when the Supreme Court saw fit to make IP yield, it frequently did so on "misuse" rather than antitrust grounds. By contrast, beginning during the New Deal and extending through the Warren era, the Supreme Court was more inclined to view patents as inherently

Law interacts with market in very interesting ways. On one hand, it is shaped by the underlying technologies and economics[115]; on the other, it also influences the development of sectors. For example, loose IP rights in India (until 2005) strengthened the pharmaceutical industry. Thus, law has both positive and normative features. The analysis presented in the paper is positive in nature, inasmuch as it looked into the present state of innovation capabilities, captured by the conceptual framework of Sectoral System of Innovation (SSI), and accordingly made prescriptions for competition law in Brazil and India. However, being mindful that the normative objective of law should be to maximize welfare, the stress should be on nudging the sector towards innovation. Consequently, even in emerging markets resort to compulsory license should be made only in exceptional circumstances.

4. Conclusion

Compulsory licensing in competition law have always been a controversial issue. Scholars have criticized compulsory licensing as it disincentivizes innovation. Especially, in sectors where innovation occupies the center stage, such as the pharmaceutical sector, issuing compulsory license may have far reaching adverse effects on welfare. Aside this, there are other reasons as well that have prevented the emerging markets from using compulsory license as a potent competition law tool. On the other hand, welfare in the short run is important too,

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anticompetitive and to interpret the antitrust laws expansively. The result was overly aggressive and sometimes even silly antitrust rules, such as those for patent ties, that found antitrust violations when the defendant had no real power and there was no realistic prospect of economic harm."

[115] For example, whether law and regulation should provide for Local Loop Unbundling (LLU) depends upon the technologies (copper, fiber or broadband) that are available in the last mile. A country's laws are many a times path dependent.

especially when merely ensuring incentives to innovate may not bring about the desired results, in the absence of other supporting institutions and actors.

This paper has taken a novel approach to assist competition agencies in making the optimal choice between the short run and the long run consumer welfare, faced with the trade-off. After explaining what innovation is, this paper investigated the Sectoral System of Innovation (SSI) in the pharmaceutical sectors of India and Brazil. Innovation is a complex process and results from the interaction among several institutions and actors specific to a sector. The comparison between India and Brazil showed that whereas the Indian firms have started moving up the R&D value chain, the Brazilian firms have little innovative capability. A legal analysis showed that issuing compulsory licenses under competition law is in perfect harmony with the TRIPS agreement. Building upon the sectoral enquiry and legal analysis, the paper made the prescription that compulsory licensing can be a valid and effective policy tool to ensure welfare in the Brazilian pharmaceutical sector; however, with better innovative capability the Indian pharmaceutical industry would be adversely affected by compulsory licenses. The approach employed here has more immediate policy implications for the countries with few or no innovative capability, such as countries in the sub-Saharan Africa.

The paper is addressed to policy makers and competition agencies in emerging markets. It has been witnessed that a mere threat to use compulsory license can compel the monopolist pharmaceutical company to reduce prices. In this regard, the example of Brazil is worth emulating for developing countries. Brazil successfully used the threat of compulsory licenses to promote its National STD/AIDS Programme. Therefore, compulsory licensing under competition law gives more negotiating strength to emerging markets against pharmaceutical firms.

CHAPTER 6

Conclusion

That great, growling engine of change…technology.[1]

Innovation is a key driver of development. In developing countries innovation also helps deal with socio-economic issues. Therefore, innovation should figure in the policy sphere in emerging markets. This thesis is an effort to stress innovation in the competition analysis in developing countries. The research here, however, does not undermine the importance of the short run objectives. In the absence of any innovative capabilities it makes little sense to achieve innovation through legal provisions– after all, law is just one of the institutions that can augment innovation. The research here is mindful of this limitation, and scientifically enunciates this argument.[2] This thesis, however, challenges the predominant understanding that the role of competition law in developing countries should be to ensure only the short run benefits.

Contrary to the conventional wisdom, innovation is not just a „first world" prerogative. It is true that the nature of innovation in emerging markets is different.[3] For example, in early stages of development incremental innovation is the dominant form of innovation. Arguably, high-technology innovation matters at a later stage of development.[4]

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1 Alvin Toffler, *Future Shock*, 1970. (Harper, S&S).

2 Especially the fourth paper, Competition Law and Compulsory Licenses in Emerging Markets: A Systems of Innovation Approach.

3 Jan Fagerberg, Martin Srholec and Bart Verspagen, "Innovation and Economic Development"(2009) UNU-MERIT, Working Paper Series, NO. 2009-032.

4 OECD (2012), "Innovation for development: The challenges ahead", in OECD Science, Technology and Industry Outlook 2012, OECD Publishing. <http://dx.doi.org/10.1787/sti_outlook-2012-7-en> (accessed 20 April 2016).

However, there are a few companies in developing world that pursue radical R&D as well. For instance, Embraer in Brazil (the world-wide third largest supplier of midrange aircraft), Huawei (a leading telecommunications firm from China), and Infosys (a global IT services provider in India) conduct cutting-edge R&D activities.[5] Regardless of the nature of innovation that developing countries pursue, innovation needs to be safeguarded and promoted through the supporting legal and regulatory framework.

Discussing innovation in the context of emerging markets is important for one more reason: the new „digital age" has brought the issue of innovation more prominently in the regulatory policy sphere in developing countries. The advancement in the ICT technology has given rise to a new form of business model that is popularly known as „sharing economy", where market players share products and services with consumers instead of owning them. Uber taxi service is one of the examples of „sharing economy".[6] This form of business model presents challenges not only for the traditional brick-and-mortar businesses, but also for the regulatory regimes both in the developed and developing world. The following example illustrates this phenomenon.

Kenya in the recent past witnessed violent protests against Uber taxi sharing service by regular taxi operators.[7] Such

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5 Maximilian von Zedtwitz, "International R & D Strategies in Companies from Developing Countries – the Case of China" UNCTAD (2005) <http://unctad.org/Sections/meetings/docs/zedtwitz_paper_en.pdf> (accessed 23 May 2016)

6 The other examples can be Airbnb, a popular accommodation providing service; and Fon, a start-up that enables people to share their home Wi-Fi service in exchange for getting Wi-Fi from other users of the same service.

7 Erica Taschler, "A Crumbling Monopoly: The Rise of Uber and the Taxi Industry's Struggle to Survive", Institute for Consumer Antitrust Studies <http:// www.luc.edu/media/lucedu/law/centers/antitrust/pdfs/ publications/ newsviews/Erica%20Taschler%20New%20%20Views%20With%20Edits%20%20Footnotes.pdf>

protests against Uber are not new. In the past Uber witnessed similar protests in Europe as well. Like other parts of the world, the business model of Uber in Kenya has led to disruption of the entrenched regulated monopoly of traditional taxi services, which has benefited the consumers eventually. In Kenya, Uber drivers charge half of what regular Taxi drivers charge.[8] At the heart of the protest is the allegation that Uber does not have to comply with the onerous regulations that regular taxi services have to comply with, which makes Uber services substantially cheaper than regular taxis. Thus, Uber has been accused of unfair competition. Such allegations led some countries such as Germany, Italy, Belgium, and Spain to put severe restrictions on Uber. Further, a class action suit was also filed against Uber in US, alleging that the company facilitates a horizontal price fixing cartel amongst the drivers.[9] This may trigger antitrust scrutiny against Uber in other parts of the world as well.

All of us who know or have used Uber would agree that it is a revolutionary innovation that has benefited the consumers immensely. It is very convenient to book a cab, that too at very cheap prices, through the Uber website or App. The cases such as Uber are new for the regulators, as such technological issues conventionally did not figure in

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(accessed 23 May 2016); see also, African Antitrust & Competition Law News & Analysis, "Uber Africa: Increased Competitiveness Not a Boon For Entrenched Monopolies" <https://africanantitrust.com/2016/02/03/kenyan-cabbies-complain-the-uber-competition-saga-reaches-east-africa/ > (accessed 23 May 2016).

[8] „ Nairobi Taxi Drivers Launch Own Battle Against Uber", Nairobi News, 25 January 2016 <http://nairobinews.nation.co.ke/jobs/nairobi-taxi-drivers-launch-own-battle-against-uber/> (accessed 23 May 2016).

[9] Spencer Meyer, individually and on behalf of those similarly situated v Travis Kalanick, in United States District Court Southern District of New York <http://blogs.reuters.com/alison-frankel/files/2016/04/ meyervkalanick-mtdoppos.pdf> (accessed 23 May 2016).

regulatory analysis. It has been observed that very often the existing regulations are outdated, and cannot completely accommodate technological issues.[10] Any regulatory scrutiny, including antitrust, therefore, must protect innovation while determining allegations against firms. Since the new technology and business models are spreading to developing world, the regulators there as well should prepare to accommodate innovation in the conventional regulatory analysis.

The internationalization of R&D as well is increasingly bringing innovative activities to developing countries. Back in the 1980s and 1990s the R&D internationalization process was restricted to the triad region [North America, Western Europe, and Japan] of developed economies; however, now the MNC R&D is shifting to developing countries such as China and India.[11] Developing countries are becoming lucrative off-shoring R&D destinations for several reasons such as cheap local expertise, good talent resources and more permissive regulatory environment to conduct research. Often MNCs choose the merger way to disperse R&D activity in developing countries.[12] In such cases, antitrust regulator should weigh rise in the market power of merged firm against alleged efficiency gains from increased R&D and innovation.

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[10] Desirée van Welsum, "Sharing is Caring? Not Quite. Some Observations About „the Sharing Economy"" (2016) Background Paper, World Bank <http://pubdocs.worldbank.org/pubdocs/publicdoc/ 2016/1/308161452529903561/WDR16-BP-Sharing-is-caring-DWELSUM.pdf> (accessed 23 May 2016)

[11] Gert Bruche, "The Emergence of China and India as New Competitors in MNCs" Innovation Networks" (2009) 11 (3) Competition & Change 267-288; Lee Branstetter, Guangwei Li and Francisco Veloso, The Rise of International Convention, in (Adam Jaffe and Benjamin Jones, eds.) *The Changing Frontier: Rethinking Science and Innovation Policy* (2015, University of Chicago Press) 135-168.

[12] ibid; see also Maximilian von Zedtwitz (n 5)

The issue of innovation may arise in cases other than mergers as well– for instance, in R&D joint ventures and co-development agreements. Some multinational pharmaceutical companies have established such joint ventures with research labs in developing countries.[13]In these cases, cooperation in innovation may result in collusion in other markets where the parties to the agreement would otherwise compete with each other. However, this form of cooperation is important for a solid innovation system. Thus, antitrust regulator should take due account of innovation gains while determining any alleged anticompetitive behavior.

For the reasons discussed above, therefore, this thesis is an attempt to assist developing countries in understanding the importance of innovation and accommodate the same in antitrust scrutiny. One may question why competition law has been chosen as a regulatory means to support innovation. Innovation requires incentives, and IP rights are one of the means to ensure those incentives by conferring legal monopoly over a product or process for certain duration. However, the concomitant market power that is manifested in the form of high prices may go against the public policy objective of ensuring cheap prices in emerging market. To this end, competition law can be a source to encourage price competition and reduce the market power of market players. However, in this process, competition law intervention may disincentivize innovative

[13] For example: "A first-of-its-kind initiative, Hilleman Laboratories is an equal joint-venture partnership formed between Merck & Co., a global research-driven pharmaceutical company and Wellcome Trust, a global charitable foundation dedicated to human and animal health. Headquartered in India, Hilleman Laboratories is a not-for-profit organization leveraging a cadre of talented scientists from around the globe." <http://www.hillemanlabs.org/about-us.aspx> (accessed 23 May 2016)

activity. Further, mergers as well can lead to rise in market power. However, in some cases rise in market power and anticipated anticompetitive short run losses may be off set or more than off set by increased capability to innovate. In such cases the dilemma is between keeping the prices low and incentivizing innovation by accepting the market power of the innovative firm. As innovation is important for emerging markets as well, the optimal role of competition law needs to be decided to support innovation against the socio-economic, political, and institutional environment. For these reasons, this thesis has investigated the role that competition law and policy can play to support innovation by discussing the examples of the ICT and pharmaceutical sectors in developing countries. The research, however, may prove helpful in understanding the role that competition law can play in fostering innovation in other sectors as well.

The thesis comprises of four papers. Each paper has its own set of research questions and methodology. However, the collective contribution of the four papers is to highlight the importance of innovation and diffusion of new technology within the context of developing countries, and then suggest a supportive antitrust framework to promote innovation in the ICT and pharmaceutical sectors, against the socio-economic, and institutional background in developing countries.

In addition, the research also throws light on the nature of competition law in emerging markets. In fact, determining the nature of competition law is the starting point before innovation can be accommodated in competition law analysis. The thesis underscores that the mainstream tools of competition law can account for different economic circumstances prevailing in developing countries–thus, there is no need to tweak the substantive competition law tools. However, the thesis agrees that the institutional environment in emerging markets is different, and thus

enforcement should be mindful of the institutional limitations.

1. Reflection on the main issues

As the thesis is predominantly about innovation, it starts with answering what dynamic efficiency, of which innovation is a part, means. In fact, the first paper, *A Conceptual Framework to Identify Dynamic Efficiency*, does not focus only on emerging markets. The paper pointed out that there was no unanimously agreed upon definition of dynamic efficiency in the literature. Whereas, economists, in general, are concerned with the concept of efficiency without stressing much on the type, legal scholars too have not devoted any attention to define dynamic efficiency. This may cause problems with respect to legal enforcement, as without a legally accepted definition, identification of claims based on dynamic efficiency may not stand legal scrutiny before competition agencies and courts. After analyzing and finding limitations of several definitions of dynamic efficiency, the paper proposed the following definition of dynamic efficiency.

Dynamic efficiencies are related to the ability of a firm and its incentives to introduce new products or processes of production (or to improve existing ones) by adopting new technology or enhancing knowledge endogenously, i.e. to move the efficient frontier of production faster or further forward. Dynamic efficiencies are therefore linked to innovation, learning by doing and research and development activities; contrary to static efficiencies, then, they display their effects generally over time.[14]

The investigation in the ICT sector, in paper two, *Access and Investment in the ICT Sector for Developing*

[14] A Conceptual Framework to Identify Dynamic Efficiency (2015) 11(2-3) European Competition Journal 319-339.

Countries, revealed that the new ICT technology has better potential to foster inclusive development, better governance including reducing corruption, and improving health and education. Additionally, ICT acts as a platform sector and enables further innovation. In fact, ICT is a key part of National Innovation System (NIS).[15] Also, state-of-the-art ICT technology is essential to overcome the „digital divide" between developed and developing countries. Consequently, in the catch-up process ICT is a critical factor.[16] But, the latest ICT technology has high price to support innovation and diffusion. Thus, most of the people in developing countries, including small businesses, would not be able to access new technology if the prices are prohibitively high. Therefore, the ICT has to be efficient and affordable at the same time. The second paper of the thesis was an effort in this direction, in that it treaded a middle path and suggested ways to ensure investment in new technology without jeopardizing the cardinal aim of ensuring cheap access to the latest ICT technology. The paper discussed two regulatory policies, Local Loop Unbundling (LLU) and Universal Service Obligation (USO) that may disincentivize diffusion of the latest ICT in developing countries.

The paper investigated the substitutability between wireless and wireline telephony, as the changes in technology affect regulatory policies. The paper looked at the qualitative differences along with changing usage pattern in developing countries to gauge substitutability, and found that basically for economic reasons (as wireless is cheaper than fixed telephony) wireless is a substitute for wireline in local loop, especially after the advent of new

[15] See for example Alexander W. Wiseman, "ICT-integrated education and national innovation systems in the Gulf Cooperation Council (GCC) countries" (2012) 59 (2) Computers & Education 607-618.

[16] Jan Fagerberg et al. (n 3)

technologies such as 4G. Also, a disruptive innovation analysis suggested that wireless has started disrupting the wireline telephony. This finding has a bearing on the LLU policy– developing countries may leapfrog to using high capacity wireless services in local loop. Thus, there is no requirement of unbundling local loops. Moreover, LLU disincentivizes rolling out new fiber optic. The paper, therefore, concludes against LLU in developing countries.

The rationale behind providing universal service is preventing exclusion, both geographic and social. USO was traditionally financed through cross subsidies: low-cost and high-income consumers pay prices above cost to subsidize high-cost and low-income consumers. USO, however, acts as disincentive for telecom service providers. Especially when the market is competitive, USO may discourage investment. On the other hand, universal service leads to positive social externalities, network effects, boost in productivity, supports economic growth, reduces energy consumption, and increases quality of life. Thus, to strike a balance between incentivizing the private sector for spreading latest technology and ensuring telecom access to the poor, the paper suggests the mechanism of the Universal Service Fund (USF) – a fund generated by taxing existing telecom services. Telecom service providers bid for the subsidies out of the USF. The company that bids for the lowest subsidy wins the bid. There are several benefits of the USF–USF does not distort the market, mimics the market outcome at the least cost and thus provides sufficient incentives for efficient entry and investment. The USF mechanism is also transparent and technology neutral.

Overall the paper showed that there are regulatory choices available that incentivize innovation and diffusion of latest technology while ensuring easy access to the poor at the same time.

The focus of enquiry shifted from the ICT sector to the pharmaceutical sector in the third and fourth paper. Pharmaceutical just like the ICT is a high-technology sector, where innovation may demand monitory incentives. However, high prices of drugs may go against the public policy objective of ensuring cheap access to healthcare. This may be a motivation to use competition law as a tool to ensure cheap prices, for example by blocking the acquisition of local generic pharmaceutical firms by foreign branded firms. There may also be fears that in the absence of any local generic drug producers, any compulsory license issued on a foreign drug would be practically meaningless. In some cases, however, such cross-border M&As may be a source of efficiency gains including innovation. For these reasons, the third paper, *Pharmaceutical Mergers and their Effect on Access and Efficiency: A Case of Emerging Markets***,** investigated the issue of cross-border M&As in the pharmaceutical sector in emerging markets. The paper showed that even by relying on the traditional competition law tools, welfare loss as a result of mergers could be accounted for. Relying upon the concept of potential competition, the research demonstrated that for emerging markets it is possible to address any welfare losses arising from the foreign takeover of substitutable generic drugs that are in the pipeline of local firms.

The research, thereafter, looked into the alleged efficiency claims arising out of M&As in developing countries. While analyzing these issues, the research took account of socio-economic, and institutional environment in emerging markets. Specifically the research dealt with the following issues.

A. The correct welfare standard for developing countries- Welfare standards decide the distribution of wealth between consumers and producers. The paper advocated the consumer welfare standard–that gives priority to consumer surplus over producer surplus– for developing

countries, as the incidence of unemployment is high and firm ownership is concentrated in emerging markets.

B. Merger to monopoly cases- The research chose to answer this question, as in emerging markets concentration levels may be high in general, and in the pharmaceutical sector in particular, owing to high entry barriers in the form of exorbitant R&D and marketing costs. After looking at the treatment of merger to monopoly cases in EU and US, the paper argued that there should not be a blanket prohibition in the cases of merger to monopoly. Transactions should be prohibited only when there is a likely consumer harm that cannot be offset by efficiencies. The prime reason for advocating this view is that the relationship between market structure and innovation is unclear. Thus, it should not matter if the merger results in monopoly, so long as the parties can prove a strong possibility to achieve efficiency.

C. When the consumer harm and efficiencies occur in different markets- Emerging markets suffer from wide socio-economic disparities. Sometimes efficiencies are argued in a market that is different from the market that experiences harm. Thus, technically, there are two different groups of consumers. In such a scenario basing the decision solely on aggregate welfare is not socially desirable. Thus, the paperargued against recognizing cross-market efficiencies in developing countries.

Further, in view of the general institutional environment in emerging markets– new and immature regulator, self-serving behavior and lack of established competition law jurisprudence- the paper advocated adoption of merger guidelines. Merger review guidelines can be a good way to discourage ideological deviations and set out an analytical framework.

This research was a starting point and by no means comprehensive. The intention behind this research was to

stress the importance of efficiencies in merger analysis and provide a workable framework in the peculiar socio-economic settings of emerging markets. Although a case-by-case approach is warranted when the choice is hard between the short run and the long run, the research has aimed to instill confidence in competition agencies when efficiencies are at stake.

The third paper also discussed the nature of competition law in developing markets. The paper argued that the general characteristics of a jurisdiction do not make a case for separate substantive standards in competition law. The paper showed that the competition assessment in developing countries depends on the socio-economic realities of a sector, and institutional realities of that jurisdiction. This theoretical framework guided the analysis of issues of access to generics and efficiencies of production.

Even though innovation, or dynamic efficiency has positive effects on overall development, what is the possibility that incentivizing the long run efficiency would benefit a sector in a developing country? It is quite possible that a particular sector shows no signs of innovation. Intuitively, in such cases it is prudent to ensure the short run benefits by keeping the prices low. Furthermore, many believe that developing countries are still in the phase of imitating foreign technology. At the most they make incremental changes/improvements in order to adapt foreign innovation to local circumstances. However, intuition is a weak ground for policy making; especially, in those sectors that are climbing the value chain and showing signs of innovation. In such cases the role of law should be to provide a supportive institution for innovation. The research in the fourth paper, *Competition Law and Compulsory Licenses in Emerging Markets: A Systems of Innovation Approach*, was based on this issue. This paper argued that innovation in competition law

should be seen from the perspective of particular sectors. Further, the standard for intervention in competition law, consumer welfare, is geared at taking into account the welfare of local consumers both in the short run and the long run, depending upon the innovative capability of a particular sector.

The paper relied on the Systems of Innovation (SI) approach and argued that innovation is a complex process that depends on the interaction between several institutions and actors, such as public and private universities, government organizations, firms, and government policies. Every sector has different set of actors, networks and institutions that characterize innovation in that particular sector. Law (including competition law) is just one of the institutions, and in the absence of an overall robust innovation system cannot, in itself, foster innovation. The paper illustrated this by comparing the innovation capability of the Indian and Brazilian pharmaceutical sector.

To compare the innovative capabilities of the Indian and Brazilian pharmaceutical sectors, the paper relied upon „international patents" granted to the Indian and Brazilian firms by the United States Patent and Trade Mark Office (USPTO). The investigation revealed that while the Indian pharmaceutical sector is showing signs of innovation, the Brazilian firms, by and large, are still in the phase of imitation. Consequently, any competition intervention that has to make a choice between the short run and long run consumer welfare, must take account of the sectoral reality in these countries. The paper demonstrated this by discussing compulsory licenses in competition law. In fact, the paper, in the absence of any innovative capability in a sector, has argued for supporting public policy objective of ensuring the short run consumer welfare, i.e. cheap prices. The research in the paper also showed that the TRIPS

agreement puts no embargo in using competition law to issue compulsory licenses.

The approach taken in the fourth paper is also helpful in determining the optimum balance between Intellectual Property (IP) and Competition Law. In those sectors that experience rapid innovations, competition law should show deference to IP created monopoly, as incentivizing the innovative firm may achieve the long run consumer welfare. Whereas, the sectors where innovation is absent or minimal, competition intervention, *prima facie*, may be used to break IP created monopolies to achieve the short run consumer welfare.

2. Contribution to the scholarship

In the recent decades more and more developing countries have adopted open markets. The deregulation of markets promises better allocation of resources. However, the market power of firms may lead to market failure in the form of higher prices and bad quality. In order to check the ill effects of market power, competition law provides a framework that ensures rivalry in the market with the end aim to achieve consumer welfare both in the short run and the long run.[17] Thus, entry barriers and such market behavior that are aimed at dampening competition are antithesis of competition rules. The role of competition law, therefore, is to offer a soft-touch regulation in neo-liberal economies.[18] This process of competition, in turn, increases productivity and reduces prices. Developing countries, therefore, can successfully employ competition law to sectors such as food and retail in order to benefit consumers.

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[17] However, very often there are trade-offs between the short run and long run consumer welfare. See paper four for a detailed discussion.

[18] As there is no direct intervention to keep the prices low, maintain or improve the quality, or to innovate.

In addition to the mentioned short run objectives, competition law can also be used to support innovation. The economic theory suggests that the long run gain of competition, i.e., innovation, outweighs the short run gains, i.e., lower prices, so far as their effect on economic growth is concerned. As argued in this thesis (especially the second paper) very often innovation can also help deal with social challenges such as health, education, and poverty reduction. However, the short run and the long run objectives are very often conflicting. The pursuit of innovation, that requires incentives, may lead to high prices for the generally less well-off consumers in developing countries. For these reasons this thesis has attempted at employing competition law to support innovation, to the extent permitted by the socio-economic realities prevailing in specific sectors in developing countries. This way the thesis can be seen as an effort to make innovation a part of development policy by suggesting a suitable competition law framework.

The relationship between law and development has been well researched, and has shaped the evolution of law in several developing countries. Indeed, law is a potent policy tool that can be effectively utilized to pursue development. As innovation is a key to development, the research focus should be directed at those laws that can augment innovation. To a certain extent, within the context of emerging markets, laws such as IP that present a choice between the short run and the long run objective have attracted scholarly attention both from the economists and legal scholars. So far, however, little attention has been paid to the relationship between competition law, innovation, and development in developing countries, as the scholars still grapple to determine the nature of competition law in emerging markets. Consequently, this research has explored the role that competition law can

play in fostering innovation and thereby development in emerging markets.

The concept of development is broad, that goes beyond a mere increase in GNP and includes poverty alleviation and reduction in inequality. This led Sen to argue that means and aim of development is to facilitate various freedoms that can enhance human capability.[19] Even while adopting the law and economics approach to the investigation, the research in this thesis has attempted to follow the broad notion of development. This approach manifested in stressing easy access to the ICT for the poor while arguing for incentivizing diffusion of the latest technology (second paper), dismissing aggregate welfare while determining efficiency standard fit for developing countries (third paper), and encouraging short run consumer welfare when little or no innovative capability is present in a particular sector (fourth paper).

Ideas are the starting point for any innovation. However, any scientific discovery needs to be made commercially available in order to be regarded as innovation. The role of law and regulation is crucial in transforming the scientific discovery into innovation. To this end, law has an interesting role to play– it should ensure optimal incentives to reward and support innovative activities. However, this thesis has argued that the optimal incentives are context driven, and are not independent of socio-economic realities. Thus, the research is also an attempt to find a balance between equity and efficiency.

This thesis has argued for a more permissive antitrust treatment of innovation in emerging markets. This research

[19] Amartya Sen, "Development as Freedom" (Oxford University Press, 1999, first published OUP paper back in 2001) p 3. Sen advocates five different freedoms: (1) political freedom (2) economic facilities (3) social opportunities (4) transparency guarantees (5) protective security.

is a starting point, in order to create a competition law framework in developing countries that is capable of recognizing dynamic efficiency gains. More generally, jurisprudential underpinnings of this thesis may serve as a good framework to analyze complex issues pertaining to law and regulation. For example issues such as net neutrality, and disruptive innovation in the sharing economy that is increasingly rendering the old business models redundant, require a nuanced economic approach to competition law with dynamic efficiency at its core. Thus, the thesis is also an endeavor to bring competition law in emerging markets closer to the economic characteristics of the „new economy", where innovation and technical changes are the core features.

3. The path ahead

This research is just a starting point in advocating a more permissive competition law regime that could accommodate dynamic efficiency gains in emerging markets. In general, developing countries do not consider innovation as a policy goal. Therefore, any such attempt to value dynamic efficiency gains including innovation, should also focus on educating the policy makers in understanding the benefits of innovation in developing countries.

The research here has investigated the role that competition law can play in fostering innovation in the peculiar socio-economic context of developing countries. A meaningful legal and regulatory environment that is conducive for innovation in emerging markets, also requires investigating and determining the role that other laws such as taxation can play in fostering innovation. Aside redistribution, tax laws can also be used to incentivize R&D–thus, there is a need to balance equity and efficiency in case of taxation as well.

The inclusion of dynamic efficiency in the existing competition law framework in developing countries opens up new questions. For example, dynamic efficiency claims are recognized in the EU and the US, only if it is shown that the gains from dynamic efficiency will be passed on to consumers. As the general consumers in developing countries are less well off, does it warrant a stronger pass on requirement in developing countries? Further, the LET (Likelihood of entry, Extent of entry and Timeliness of entry) test with respect to dynamic efficiency needs to be adapted in the specific context of emerging markets.

Additionally, antitrust institutions, both regulators and courts, play critical role in the assessment of dynamic efficiency concerns in antitrust. Even in mature jurisdiction, courts have struggled to incorporate dynamic efficiency concerns. This is because dynamic efficiency analysis is inherently predictive in nature, engendering uncertainty, and diminishing the predictability of law.[20] Further, at present the economic and legal tools are not advance enough to perfectly assist a dynamic efficiency analysis of antitrust issues. [21] The industrial organization dominant antitrust analysis is predominantly static in nature, primarily because of the lack of predictable and defensible economic tools that can assist the agencies and court to make informed decisions about dynamic issues. This problem is more acute in new competition law jurisdictions where the antitrust institutions are under-funded and have little experience even of the static competition law analysis.

Only an independent and capable regulatory body can carry out objective competitive assessment where innovation is given due weightage. The antitrust

[20] Douglas H. Ginsburg and Joshua D. Wright, "Dynamic Analysis and The Limits of AntitrustInstitutions" (2012) 78 (1) Antitrust law Journal 12-48.

[21] ibid

institutions in the new competition regimes are largely immature and suffer from pre-liberalization institutional memory.[22] A young antitrust institution requires guidance with respect to recruiting competent staff, and to know how best to assign work to different teams comprising of lawyers and economists. Also, a regulator is in perennial competition with the private sector in order to choose and retain the best talent. Bureaucratic traditions and administrative procedures in every country are also different. Therefore, it is also important to see to what extent the lessons from the mature jurisdictions can be transplanted within the administrative law set up of developing countries. The future research, therefore, should be directed at shifting the focus of scrutiny from substantive competition law rules to the institutional enquiry in the emerging market context.

[22] The author spoke to several competition law experts and practitioners both at the Competition Commission of India and outside about the competition law enforcement in India. There is a startling pattern in the cases that have been overruled/reversed/ modified by the appelate bodies– most of the cases were heard and decided on the grounds of procedural fairness rather than the merits of a case.

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CHAPTER 2

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CHAPTER 3

Access and Investment in the ICT Sector for Developing Countries

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CHAPTER FOUR

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CHAPTER 5

Competition Law and Compulsory Licenses in Emerging Markets: A Systems of Innovation Approach

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CHAPTER 6

CONCLUSION

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It is widely accepted that innovation is a key factor to growth and development. Consequently, a sustained effort has been made in the Western scholarship to promote innovation through various means, including law. As part of jurisdiction specific public policy, law strikes a balance between incentives to innovators that undertake risky R&D, and ensuring easy access for the ones who cannot pay high prices for innovative goods. This dilemma also arises in competition law. In developing countries, where competition law is relatively new, not much research has been done to determine the optimum role of competition law that can ensures cheap prices, while also fostering innovative activities through adequate incentives, to the extent it is possible in the peculiar socio-economic environment. This research is aimed at bridging this gap. This work makes an investigation into the Information and Communication Technology (ICT) and the Pharmaceutical sector– both are characterized with rapid innovation and have huge implication for social welfare– and shows that how, even while ensuring price competition and cheap access, developing countries can still successfully support innovative activities through competition policy.

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